"ORAL HEALTH STATUS AND TREATMENT NEEDS AMONG ELEMENTARY WORKERS IN AN EDUCATIONAL INSTITUTION AT TIRUCHENGODE, TAMILNADU- A CROSS SECTIONAL STUDY."

Dissertation Submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVRSITY

In Partial fulfillment for the Degree of

MASTER OF DENTAL SURGERY

BRANCH – VII

PUBLIC HEALTH DENTISTRY

2016-2019

CERTIFICATE BY THE GUIDE

This is to certify that the dissertation titled **"Oral Health Status And Treatment Needs Among Elementary Workers In An Educational Institution At Tiruchengode, Tamilnadu- A Cross Sectional Study"** is a bonafide work done by **Dr. M.A.J. Mary Kural Ayeni,** Postgraduate student, during the course of the study for the degree of **MASTER OF DENTAL SURGERY** in the speciality of **PUBLIC HEALTH DENTISTRY,** Vivekanandha Dental College for Women, Tiruchengode, during the period of 2016-2019.

Date: 12/1/19

Place: Tiruchengode

Signature of H.O.D & Guide

Dr.Girish R. Shavi , M.D.S. ,
Head of the Department,
Department of Public Health Dentistry
Vivekanandha Dental College for Women

H.O.D. Dept. of Public Health Dentistry

Dept. of PHD.,
Vivekanandha Dental College for Women

ENDORSEMENT BY THE HEAD OF THE DEPARTMENT

AND HEAD OF THE INSTITUTION

This is to certify that **Dr. M.A.J. Mary Kural Ayeni,** Post Graduate student (2016-2019) in the Department of **PUBLIC HEALTH DENTISTRY**, Vivekanandha Dental College for Women, has done this dissertation titled **"Oral Health Status And Treatment Needs Among Elementary Workers In An Educational Institution At Tiruchengode, Tamilnadu - A Cross Sectional Study"** under our guidance and supervision in partial fulfillment of the regulations laid down by the Tamilnadu Dr. M.G.R. Medical University, Chennai-600032, for **M.D.S (Branch -VII).**

12/1/19

Seal & Signature of H.O.D

Dr. Girish R. Shavi M.D.S.,

Head of the Department

Department of Public Health Dentistry

Vivekanandha Dental College for Women

H.O.D. Dept. of Public Health Dentistry

Dept. of PHD.,
Vivekanandha Dental College for Women

N. Balan 12.01.19

Seal & Signature of Principal

Prof. **Dr. N.Balan, M.D.S.,**

Principal,

Vivekanandha Dental College for Women

Tiruchengode, Namakkal.

PRINCIPAL,
VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN,
Elayampalayam - 637 205.
Tiruchengode - Tk. Namakkal Dt. Tamil Nadu

DECLARATION

TITLE OF DISSERTATION	Oral Health Status And Treatment Needs Among Elementary Workers In An Educational Institution At Tiruchengode, Tamilnadu - A Cross Sectional Study
PLACE OF STUDY	Vivekanandha Dental College for Women, Elayampalayam, Tiruchengode, Namakkal District.
DURATION OF THE COURSE	3 Years (2016- 2019)
NAME OF THE GUIDE	Dr. Girish R. Shavi , M.D.S.
HEAD OF THE DEPARTMENT	Dr. Girish R. Shavi , M.D.S.

I hereby declare that no part of the dissertation will be utilized for gaining financial assistance for research or other promotions without obtaining prior permission of the Principal, Vivekanandha Dental College for Women, Tiruchengode. In addition, I declare that no part of this work will be published either in print or electric without the guide who has been actively involved in the dissertation. The author has the right to reserve publishing of work solely with prior permission of the Principal, Vivekanandha Dental College for Women, Tiruchengode.

12/1/19

Head of the Department
Dr.Girish R.Shavi, M.D.S.

12/1/19

Guide
Dr.Girish R.Shavi, M.D.S.

J Ayeni

Signature of the Candidate
M.A.J. Mary Kural Ayeni

CERTIFICATE –II

This is to certify that this dissertation work titled **"Oral Health Status And Treatment Needs Among Elementary Workers In An Educational Institution At Tiruchengode, Tamilnadu - A Cross Sectional Study"** of the candidate **Dr. M.A.J. Mary Kural Ayeni**, with Registration Number 241623202 for the award of degree **MASTER OF DENTAL SURGERY** in the branch of **Public Health Dentistry**. I personally verified the urkund.com website for the purpose of Plagiarism Check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 8% of plagiarism in the dissertation.

12/11/09

Guide & Supervisor sign with Seal

H.O.D. Dept. of Public Health Dentistry

Dept. of PHD.,
Vivekanandha Dental College for Women

Urkund Analysis Result

Analysed Document: Complete dessertation plagarism check.pdf (D46170830)
Submitted: 12/21/2018 9:55:00 AM
Submitted By: maryayeni@ymail.com
Significance: 8 %

Sources included in the report:

http://www.jhrr.org/article.asp?issn=2394-2010;year=2014;volume=1;issue=1;spage=15;epage=19;aulast=Sharma
https://mafiadoc.com/dental-caries-status-and-oral-hygiene-practices-of-lock-factory-_5a9091631723dd2e2dbf6397.html
http://europepmc.org/articles/PMC4479775
https://www.ncbi.nlm.nih.gov/pubmed/24086913
https://www.hindawi.com/journals/scientifica/2016/9860387/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5621182/
https://www.ncbi.nlm.nih.gov/pubmed/28979074
https://worldwidescience.org/topicpages/p/poor+oral+hygiene.html
https://journals.viamedica.pl/international_maritime_health/article/view/IMH.2014.0037/34451
https://healthdocbox.com/83088987-Dental_Care/Prosthetic-status-and-prosthetic-needs-amongst-geriatric-fishermen-population-of-kutch-coast-gujarat-india.html
https://zdoc.site/prosthetic-status-and-prosthetic-needs-of-patients.html
https://www.ncbi.nlm.nih.gov/pubmed/6635609
http://medind.nic.in/iaj/t15/i1/iajt15i1p33.htm
http://repository-tnmgrmu.ac.in/9827/1/240726918prathap.pdf

Instances where selected sources appear:

24

ACKNOWLEDGEMENT

My sincere gratitude to **Dr. Girish R. Shavi**, Professor and Head of the Department of Public Health Dentistry, Vivekanandha Dental College for Women, for his valuable guidance and advice, constant support and encouragement throughout this dissertation and my post graduate programme.

My cordial thanks to **Dr. (Capt) S.Gokulanathan, B.Sc, MDS**, Dean, and **Dr. N.Balan, MDS**, Principal, Vivekanandha Dental College for Women for the noble support rendered during my post graduate life.

I express my heartfelt thanks to **Dr.S.Ranganath MDS, Dr.S.Shankar MDS** Reader in the Department of Public Health Dentistry for having guided me with their valuable suggestions and immense support wherever needed throughout the preparation.

Dr.G.Lalithambigai MDS, Dr.C.Rahila MDS Senior lecturers, Department of Public Health Dentistry, were a true source of inspiration and encouragement. I express my deep sense of gratitude to all for their invaluable support throughout my post graduate programme.

My sincere thanks to all the elementary workers who were willing to participate in my study. I would also like to extend my heartfelt thanks to **Prof. Dr.M.Karunanithi,** Chairman and Secretary, Vivekanandha Educational Institutions for Women, **Mr.Chokalingam** General Manager, all the other division supervisors and members of Vivekanandha Educational institution for their support throughout the survey.

I wish to thank my seniors, **Dr. S.Santhakumari** and **Dr. S.Anjali** for their enormous help and support throughout this dissertation work. I take great pleasure to extend my gratitude to my friend **Dr. S. Kalaivani** for her friendly help and cooperation throughout my postgraduate life. I am thankful to my juniors **Dr. S. Sathiya Priya, Dr. Krishnaja Kumar,** and **Dr. S. Ashwini** for being with me in all occasions and never letting me down.

I feel so blessed to have a wonderful family, who make it a point to remind me that I'm special to them. Without them, I would not have reached this height.

Finally, above all I thank the Almighty God for his bountiful grace throughout my life and for being my strength and my shield.

Truly,

Dr. M.A.J.Mary Kural Ayeni

LIST OF CONTENTS

LIST OF TABLES

LIST OF GRAPHS

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
CAL	Clinical Attachment Loss
CI	Confidence Interval
CPI	Community Periodontal Index
CPITN	Community Periodontal Index of treatment needs
DT	Decayed Teeth
DMFT	Decayed, Missing, Filled Teeth
DSTN	Dentition Status and Treatment Needs
FT	Filled Teeth
ISCO	The International Standard Classification of Occupations
ILO	International Labour Organization
LOA	Loss Of Attachment
MT	Missing Teeth
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

ABSTRACT

Introduction:

Oral health has a significant impact on quality of life. The elementary workers belong to the lower socioeconomic group. The health of workers often goes uncared for due to their stressful working conditions, busy schedules, poor economic conditions and hence prone for unfulfilled treatment needs. This creates the need to assess their oral health status and treatment needs.

Aim:

The aim of the study is to assess the oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode, Tamil Nadu.

Methodology:

A descriptive cross-sectional survey was conducted to assess the oral health status and treatment needs of 600 elementary workers in an educational institution at Tiruchengode, Tamil Nadu. The study subjects were recruited by random sampling and the data was collected using a questionnaire and World Health Organization (WHO) Oral Health Assessment Form 1997. The collected data was subjected to statistical analysis using, Statistical Package for the Social Sciences (SPSS) software version 20.

Results:

Among the elementary workers included in the study 411(68%) were males and 189(32%)were females. About 5.33% of the study subjects had abnormal oral mucosal conditions. Over 19% of workers used neem stick to clean their teeth. About 66% of elementary worker had periodontal diseases.The prevalence of dentalcaries among the study population exhibited a mean Decayed Missing Filled Teeth (DMFT) of 3.58±4.73.

Conclusion:

The elementary workers do suffer from various oral health problems like dental caries and periodontal disease. It is observed that continuous professional research and health care development is essential to improve their overall health.

Key words:

Elementary workers, Oral health status, Treatment needs.

INTRODUCTION

Health is defined as a state of complete physical, mental and social well being and not merely an absence of disease or infirmity.[1]Health is important for the overall well being of an individual, to enjoy a serene state of mind and to lead an efficient and productive life. Achievement of the highest level of health is the right of every individual and is a worldwide social goal. This goal continuously motivate the health care providers to pursue research, to meet the changing demands of the community and to have evidence based knowledge about all the aspects of health sciences. Earlier there was a tendency to view health as mere absence of disease, however with contemporary development in social sciences, a holistic approach towards health is now widely accepted and practiced. Such an outlook has recognized health as a multi-factorial concept. Excellent health always enable people to participate in all the physical, social, and psychological dimensions of their daily activities.

The oral health plays an important role in the individual's well being and is considered as the integral part of general health. Even though there is remarkable world-wide progress in the field of diagnostics, curative and preventive oral health care but oral diseases, such as untreated caries, severe periodontitis and severe tooth loss, were listed among the top 100 Global Burden Diseases in 2010.[2]It continues to be a matter of neglect by most people owing primarily to lack of awareness about its links with general health particularly among elementary workers.

Occupation is an activity or task with which one occupies oneself, usually any productive activity, service, trade, or crafts for which one is regularly paid. The International Standard Classification of Occupations (ISCO - 08)[3] given by

International Labour Organization has classified various occupations under 0-9 Major Groups.In which Major Group 9 holds for elementary occupation.

Major Group 0 - Armed and Forces Occupations

Major Group 1 - Managers

Major Group 2 - Professionals

Major Group 3 - Technicians and Associate Professionals

Major Group 4 - Clerical support Workers

Major Group 5 - Services and Sales Workers

Major Group 6 - Skilled Agricultural, Forestry and Fishery Workers

Major Group 7 - Craft and Related Trades Workers

Major Group 8 - Plant and Machine Operators and Assemblers

Major Group 9 - Elementary Occupation

The elementary occupation is further classified into sub - major groups as Cleaners and Helpers; Agricultural, Forestry and Fishery labourer; Labourers in mining, Construction, Manufacturing and Transport; Food Preparation Assistants; Street and Related Sales and Services Workers; along with Refuse workers and other Elementary workers.

Thus, Elementary occupations involve the performance of simple and routine task which may require the use of hand held tools and considerable physical effort. The elementary workers are employed in various sectors like Water and waste treatment; Mining and quarrying; Energy supply services; Agriculture, Forestry and Fishing; Public sector and defence; Health and social care; Education; Manufacturing; Wholesale and retail trade; Transport and storage; Accommodation and food; Construction; Professional services; ICT (Information and communications

technology) services; Finance and insurance; Arts and recreation; Administrative services.

The educational institution is one which has a huge number of elementary workers, who involve in activities like cleaning; restocking supplies; performing basic maintenance in hostels, kitchen, office and other buildings; helping in kitchen and simple task in food preparation; delivering message or goods, sweepers, and so on. As every human in this world has the right to lead a healthy life.The amount of well being which an individual enjoys is governed by the standard of living which includes income, occupation, sanitation, education, level of provision of health, recreation and nutrition. The elementary workers, who help us in our day to day activities remain one of the poorest, most economically disadvantaged working people. Not only being struck with poverty their oral health status also goes uncared due to their stressful working conditions, busy schedules and dietary habits. Factors more commonly held responsible for the impact of oral health diseases could be less access, knowledge and utilization of the health care services with the elementary workers. This population sector are involved with the local productivity and economically active population, so it is important to know their oral health status focusing to create awareness of the ill-effects of their habits and approach towards oral healthcare and oral health promotion in their working environment as a needful one.

Hence this study is proposed to assess the oral health status and treatment needs of elementary workers in an educational institution at Tiruchengode.

AIM AND OBJECTIVES

AIM:

The aim of the study is to assess the oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode, Tamil Nadu.

OBJECTIVES:

1. To gather the baseline data among elementary workers in an educational institution at Tiruchengode, Tamil Nadu, regarding their demographic profile and oral hygiene practices using a questionnaire.

2. To assess the oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode, Tamil Nadu, using WHO Oral Health Assessment Form 1997.

REVIEW OF LITERATURE

Peterson PE (1983)[4]conducted a study to investigate on the utilization of dental services, the distribution of dental diseases and treatment needs among the population of industrial workers, Dannish. The study involved the male population at Dannish shipyard and a sample of 988 workers and clerical and management staff. A stratified random sampling was done, about 841 persons were interviewed regarding dental visit and attitude towards the dental health services and the data on dental health and treatment needs were collected using WHO basic oral health survey 1977.Over 61% of the participants aged 15-64 years underwent dental check up once a year. The mean DMFT increased from 16.6 in the age group of 15-24 years to 27 among 55-64 years age group. The study concluded that the untreated dental treatment was prominent among workers and persons never seeing a dentist, where as there were more filled teeth and fewer missing teeth among staff and regular visitors. The periodontal status was less acceptable in the older age groups and among workers. Workers among the age group of 35-64 years were found to have dentures. In accordant to the findings on dental health status, dental treatment needs due to caries and periodontal disease as well as prosthetic treatment needs varied according to age, occupation and dental visits. More radical treatment types were needed in the older age groups, among workers and non-regular visitors.

MasalinK, **Murtomaa H, Meurman JH (1990)**[5]conducted a study among the workers in the modern Finnish confectionery industry to find out the association between type of work and dental findings and the relevance of sugar dust as an occupational hazard to dental health was studied in workers producing sweets, biscuits, and bakery products, and in controls in a work environment not concerned

with sugar. The study was carried out by comparing the oral health status of workers exposed to such dust on production lines on which sweets, biscuits and other sugar containing products were made with the oral health status of workers in the same company not exposed to such dust. The study population was 700 workers in biscuit, sweet and bakery production lines in a modern Finnish confectionery factory. An internal control group was chosen from workers not employed in production or not active in units directly associated with sugary environments. Clinical assessment was carried out using WHO criteria 1977. Dental caries were recorded using DMFS and periodontal status using CPITN. All subjects were given a questionnaire before clinical investigation for recording medical and dental examination. Highest DMFS means 73 were found in employees working in biscuit and confectionery production than controls with DMFS 60.4. Maximum CPITN sextant scores of 3 and 4 were most frequent in biscuit group.

Ahlberg J, **Tuominen R, Murtomaa H (1996)**[6] conducted a study to assess the knowledge and attitudes concerning oral health care among male industrial workers in Finland with or without access to an employer provided dental benefit scheme and whether these factors were associated with utilization of dental services. The study population consists of 325 subsidized workers and 174 controls. Data was collected using a pre tested postal questionnaire survey and clinical examination using mouth mirror and WHO periodontal probe and explorer in good light. Results showed that 60% of the subjects in both the groups had visited a dentist within past 12 months. Subjects in both the study groups who had not visited a dentist within past 2 years were most likely to claim a lack of symptom as the reason. Probability of a dental visit within past 2 years was positively associated with access to an employer

provided dental benefit scheme, tooth brushing to maintain dental health and negatively associated with the number of carious teeth.

Amin WM, AL-Omoush SA, HattabFN (2001)[7]conducted a study to assess the oral health of workers exposed to acid fumes in phosphate and battery industries in Jordan. Study population includes 68 subjects (37 acid workers and 31 controls who were drawn from acid free department) in the phosphate industry and in the battery factory 39 subjects (24 acid workers and 15 controls). Structured questionnaires were used to collect data on medical and dental histories, dietary habits, parafunctional habits, oral hygiene practices and dental symptoms. Oral hygiene was examined using Oral Hygiene Index – Simplified and gingival status examined using Gingival Index. Results showed that the oral hygiene practice was poor. Only 14% of acid workers and 25% of controls brushed their tooth daily. 12% had visited a dental clinic during the past year mainly for extraction. More than half (58%) were smokers. Two thirds (66.6%) had poorer oral hygiene score, one third had fair score and none had good OHI-S score than controls.79.3% of acid workers in battery factory had scores 2 and 3.

Bachanck T, Pawlowicz A, Tarczydlo B, Chalas R(2001)[8]studied the incidence of dental caries among the workers of flour mills. The study covered 48 workers (40 males and 8 females), currently employed in three flour mills in Lublin city, Poland. Examination was carried out in artificial light, using a mirror and dental explorer. The average DMFT index was 17.4 in males and 19.62 in females and 17.77 in whole examined group. The results of the study indicate the necessity of intensification of stomatological care among mill workers.

Tomita NE, Chinellato LEM, Lauris JRP, Kussano CM, Mendes HJ, Cardoso MT(2005)[9] in their study they evaluated the oral health conditions of building construction workers from a city in the mid-west region of São Paulo, Brazil. This study involved 219 male subjects, aged 17 to 72. The random sample utilized the functional number of each worker as a criterion to the raffle, which took into account all 450 subjects registered in the Working Accidents Prevention Program. The examination of oral health conditions by DMFT index and need of treatment were carried out according to WHO criteria (1997). This paper reports the prevalence of caries according to age, occupation and educational level. Among the 219 workers examined, the mean DMFT was 16.9. Amongst the younger workers (<25 years old) were 21.3 teeth showed no need of treatment, while the older ones showed increasing treatment needs ($p<0.001$). The DMFT values were 15.6 for the administrative duties and 21.7 for foremen and bricklayers, although the differences were not statistically significant. The DMFT index showed an increase with age for all groups ($p<0.001$). The self-reported need of treatment was associated with a smaller DMFT for people that reported a positive response when compared with subjects that did not report these needs ($p<0.05$). These differences were statistically significant, as tested by ANOVA and Student t test. Among the building construction workers, in this study, important oral lesions were not observed, despite the daily exposition to some risk factors for oral cancer.

Roy S, Dasgupta A(2008)[10]conducted a study to find out the health status of women engaged in a home based "papad making" industry in a slum area of Kolkatta, and the occupational factors influencing their health status and their felt health needs. The study subjects consists of 80 women between age 14 – 60yrs. Data

was collected using predesigned and pretested schedule with questions regarding their socio economic condition, their occupational history and their health problems and by clinical examination and observation. Results showed that Neck (33.5%) was the most commonly affected part. A significant relationship was found to exist between duration of occupation and musculoskeletal problem ($p<0.001$). On examination Pallor (75%), angular stomatitis (25%), pedal odema (17.5%), poor oral health (15%), hypertension (12.5%), epigastric tenderness (10%), scabies (7.5%) were found.

HaldiyaKR, Sachdev R, Mathur ML (2010)[11]conducted a study to identify the work related health problems in salt workers of Rajasthan, India. A total of 865 workers were studied. Data was collected in health camps held at Sambhar, Nawa and Phalodi salt manufacturing units. Data was collected regarding age, gender, detailed occupational history and nature of job and duration of working in a pre designed schedule. JNC VI criteria was used for making the diagnosis of hypertension. Results showed that prevalence of work related symptoms was 85.9% among the salt workers. Prevalence of ophthalmic symptoms was 60.7%, dermatological symptoms was 43.8%, symptoms like head ache, giddiness, breathlessness, muscular and joint pain was present on 52.1 % of salt workers.

SoodM, Blaggana A, Vohra P, Saraf B (2011)[12]conducted a study in a group of Ceramic factory workers. A male dominated work place may add to the habit and its effects. Hence the study aimed to evaluate the effects of smoking on the periodontal health of a group of Ceramic factory workers have been compared with non smokers. Six hundred and twenty six male subjects formed the sample size having 177(28.27%) subjects with smoking habit. Each subject was examined in the equipped community dental van for Community Periodontal Index (CPI) score using

CPITN probe and Clinical Attachment Level (CAL) score using Williams's periodontal probe. It was found that the CPI scores showed no significant difference in smokers and non smokers. Clinical Attachment Loss was significantly higher in smokers in comparison to non smokers. The unrecorded sextants due to missing teeth were greater in smokers. The study concluded that the oral health was neglected by all factory workers studied. Smoking was evidently a risk factor for higher levels of periodontal disease. These observations emphasize the urgent need of treatment in these factory workers.

BansalM, Veeresha KL et al (2013)[13]conducted a study to assess the oral health status and treatment needs among factory employees in Baddi (Himachal Pradesh), India. A cross sectional study was carried out in 38 factories among 1384 employees. Information regarding demographic details, habits and data on oral health status and treatment needs was collected on modified World Health Organization (WHO)format (1997) and WHO criteria and Pindborg's colored atlas were used for diagnosis oforo‑mucosal lesions. The study exhibited that tobacco pouch was the most common lesion found and buccal mucosa was the most common site involved. The prevalence of caries was found to be 18.5% of which males were 15.2% and females were 84.8%. The mean decayed filled missing teeth was 2.18 and was higher among females (3.18) than males (2.0). Need for one unit prosthesis was required for both maxillary and mandibular arches (9.5% and 14.8% respectively). Community periodontal index score 2 was found more in males 58.4% than females 48.8%, which was significantly related to brushing frequency. Thus, the result from the baseline study indicate that primary oral health care programs like dental screening and oral

health education at regular intervals should be made mandatory, which will help to prevent accumulation of health‑care demands of the factory employees.

Batista MJ, Rihs LB, Sousa MR (2013)[14] described the oral health status of adult workers in an extended range age (20-64 years old) of a supermarket chain. A cross-sectional survey was conducted in a company in the state of São Paulo. A total of 386 workers aged 20 to 64 years old were examined following the guidelines recommended by the World Health Organization (1997) with respect to caries, treatment needs for caries, and need and use of dental prostheses. Age was stratified into groups for analysis. A descriptive analysis was performed and tooth loss rate was calculated. Kruskal Walisand Tukey's tests were used for the evaluation of differences in DMTF and chi-square test was used for treatment needs. The mean DMFT was 14.6 (± 8.3), and differences were found among the 3 groups, mainly due to missing teeth. DMFT was 10.8 (±6.95) in the 20-34 year old group, 19.6 (±6.13) in the 35-44-year-old group and 22.1(±7.32) in the 45-64-yearoldgroup. Significant differences in tooth loss rate were observed between the age groups (tooth loss rate ranged from 18% to 81%). Among the adults, 53.5% had treatment needs for caries. Hence the study concluded that the younger adult workers in this study showed better oral conditions and an increase in tooth loss was observed in the older individuals. Considering common risk approach, dentistry should work together with health promotion for the studied population of workers in order to meet the oral treatment needs and prevent new tooth losses

ManchandaK, Naganandini S (2013)[15] conducted a study to evaluate the Oral Health Status And Treatment Needs among Apple Farm Workers In Shimla (Rural), Himachal Pradesh. Data was collected from 900 farmers, working in the

apple orchards, by using a specially prepared proforma, WHO 1997 'Oral health Assessment Form' and Silness and Loe plaque index. The study reported subjects with bleeding and calculus were 6.6% and 65.4% respectively; subjects with shallow pockets (4-5mm) were 22.4% and with deep pockets (> 6mm) were 2.0%. The mean number of decayed permanent teeth per person was 5.01+ 3.31. The plaque score for this study population was 0.9. Hence, the findings of this study clearly indicate the relatively low prevalence of severe form of periodontal disease, high prevalence of dental caries and good plaque score among this population.

SanadhyaS, Nagarajappa R, Sharda AJ et al (2013)[16] conducted a study among the workers of Sambhar Salts Limited at Sambhar Lake, Jaipur, India.To assess the oral health status and the treatment needs. Salt workers are exposed to the adversities of environmental conditions such as direct sunlight, salt dust and contact with brine, which have an impact on the health of workers. Since oral health is an integral part of the general health, we planned to determine its effect on the oral cavity. Hence, a cross sectional survey was conducted among 979 subjects who were aged between 19–68 years, who were the workers of Sambhar Salts Limited, Sambhar Lake, Jaipur, India. An interview and clinical examination was conducted, based on the World Health Organization guidelines. The Chi–square test, t–test, One way Analysis of Variance and a Stepwise multiple linear regression analysis were used for the statistical analysis .The results of the study exhibited that females had a significantly greater prevalence of dental fluorosis (71.7%) and periodontal disease (96.4%) as compared to males (p= 0.001). The mean number of healthy sextants (0.71 ± 0.09) and the mean DMFT (5.19 ± 4.11) were also significantly higher in females as compared to those in males (p=0.001). The gender and oral hygiene practices for

dental caries and periodontal disease were respectively identified as the best predictors. Hence the authors concluded that considerable percentages of salt workers have demonstrated a higher prevalence of oral diseases. Higher unmet treatment needs suggest a poor accessibility and availability of oral health care, in addition to a low utilization of preventive or therapeutic oral health services.

Khurana S, Jyothi C, Dileep CL, Jayaprakash K (2014)[17] conducted a study to assess the oral health status in battery factory workers of Kanpur city and described the prevalence and nature of oral health problems among workers. In this study a total of 70 battery workers were enrolled and divided into study and control groups based on acid exposure. The data was recorded on a modified World Health Organization 1997 proforma. The data was analyzed using Statistical Package for Social Sciences version 15.0. The categorical variables were compared using Chi‑square test for proportions while the quantitative ordinal variables were compared using Mann–Whitney U‑test. Quantitative continuous variables were compared using Independent samples t‑test. The study reported a mean age of all the workers surveyed was 36.24 years. Differences in the erosion, oral hygiene and gingival index scores among the two groups were highly significant ($P < 0.001$). Hence the study concluded that oral health status was poor and significantly associated with dental erosion.

Sharma A, Thomas S, Dagli RJ, Solanki J, Arora G, Singh A (2014)[18]have done a study to evaluate the oral health status of cement factory workers. A descriptive cross sectional study was carried out at Sirohi, Rajasthan. A total of 90 study subjects were included. They were all males who were in the age group of 20-58 years and are permanent employees of the cement factory. For recording the oral

hygiene status and dental caries status, The Oral Hygiene Index Simplified (Greene and Vermillion, 1964) and The DMFT Index (Henry T. Klein, Carrole E. Palmer, Knutson J. W., 1938) are used, respectively. Wasting diseases were also recorded. Chi-square was used to find association of dental caries, oral hygiene status, oral lesions and wasting diseases with age, education, brushing habit, frequency of brushing and tobacco use. $P < 0.05$ was considered statistically significant. It was found that tooth wear was seen among50% of the study subjects. Forty percent of the subjects had adverse habit. Significant association of wasting diseases was found with age ($P = 0.004$), education ($P = 0.022$) and adverse habit ($P = 0.014$). Adverse habit was also significantly associated with oral lesions ($P = 0.000$). Thus, most of the factory workers had dental caries and poor oral hygiene. Fifty percent had tooth wear. So, there is a need of oral health education and motivation for these workers along with oral health care facilities in the premises.

Sherley MM, Nivetha A, Ganesh R(2015)[19] conducted the oral health status of cracker workers in Sivakasi. A total of 350 subjects were included in this study. The subjects were randomly selected from 10 companies in Sivakasi. Data were collected by using WHO Oral Health Assessment Form for Adults (2013). The proforma included questions on knowledge, attitude and practices of oral hygiene. Statistical analysis was performed using statistical package for social sciences version 16.0. The study reported that among 350 subjects, 34.9% were males and 65.1% were females. The mean number of decayed, missing, and filled teeth was 2.52, 4.17, and 1.32 respectively. The mean of sextants with shallow pockets is 5.9 and its percentage is 54. The mean of sextants with deep pockets is 1.5 and its percentage is 14.6. Oral lesions were found to be present among 4.3% of study subjects. The study concluded

that workers of fireworks industries those with dental caries, periodontal problems, and other dental complaints should be examined repeatedly for their oral health status.

Singh M, Ingle NA, Kaur N, Yadav P, Ingle E, Charania Z (2015)[20]conducted a study to evaluate the oral hygiene practices and dental caries status of lock factory workers in Aligarh city. WHO Oral Health Assessment form (2013) was used to collect data from each subject. A total of 850 subjects constituted the final sample size. Information was obtained regarding the oral hygiene practices and clinical examinations were conducted. Descriptive analysis was done and the data were analyzed using Chi-square test. The study reported the prevalence of dental caries was 46.5%. Almost half of the workers i.e., 456 (53.6%) used brush to clean their teeth. Majority of the subjects i.e., 784 (92.2%) cleaned their teeth once a day. It was found that 466 (54.8%) used toothpaste for maintaining oral hygiene. Almost half of the subjects consumed tobacco in form of gutkha, cigarette, and in multiple forms. The authors through their study showed that dental caries and poor oral hygiene are major public health problems among the factory workers. Primary oral health-care programs like dental screening and oral health education at regular intervals should be made mandatory, which will help to prevent accumulation of health-care demands of the factory employees.

Cavalcanti AF, Fernandes LH, Cardoso AMR, Santos JSJ, Maia EG, Cavalcanti AL (2017)[21] conducted a study to evaluate the oral health status of Brazilian workers of a textile industry. A cross-sectional study was conducted including 489 individuals of both sexes. Data on gender, age, schooling, frequency of dentist visits and caries experience (DMFT) were collected by a single trained and calibrated examiner. Data were organized using the Statistical Package for Social

Sciences (SPSS) software and presented through descriptive and inferential statistics (Poisson Regression Analysis).The significance level was 5%. The results exhibited a predominance of female workers (57.7%) aged 30-39 years (44.6%) and with 9-11 years of schooling (79.7%). Almost all of them had visited the dentist at least once in their lifetime (99.6%), and 66.8% had done so in the last 12 months. The mean DMFT value was 11.14 (± 5.64), with higher participation of filled (6.21) and missing components (4.03). There was a statistically significant association between DMFT values (≤ 11 and ≥ 12) and age group ($p<0.001$), as well as between schooling and number of missing ($p <0.001$) and decayed teeth ($p < 0.001$). The study concluded that the mean DMFT of Brazilian workers is high, with a tendency to increase the number of missing teeth as age increases. Education was associated with the number of missing and filled teeth.

Jyothi C, Giriraju A (2017)[22]conducted a study that aimed to assess oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, Karnataka. A descriptive cross sectional survey was carried out among 175 Jeep battery manufacturing factory workers in Metagalli, Mysore, Karnataka. Information regarding demographic details and oral habits was collected using specially designed questionnaire. Data on oral health status and treatment needs was collected DMFT Index and CPITN index by conducting intra-oral examination. The study exhibited about 25.71% among factory workers had the habit of smoking, 0.57% had habit of beetle nut chewing and 3.43% had the habit of ghutka chewing. The total average DMFT score among all workers was 1.71. About 46.28% of workers required scaling procedure and 1.71% of workers required periodontal surgery. The study concluded that majority of the participants in the survey had habit

of tobacco chewing and smoking. Participants had problem of dental caries, gingivitis and periodontitis requiring treatment.

Rao BV, Suresh Babu AM, Kamalsha SK, Rao MS, Karthik K (2017)[23]conducted a descriptive study to assess the oral health status and treatment needs among 550 laborers of Gunj marketing yard of Raichur city in 2017. A specially designed questionnaire was used to assess the demographic variables and oral hygiene practices. Oral health status was assessed using the WHO assessment form 1997. Simplified oral hygiene index (1964) was used to assess the oral hygiene status. It was found the study participants were in a mean age group of 35.1 (± 8.02) years and the mean decayed teeth, missing teeth, filled teeth, and decayed, missing, filled teeth was 2.06 (± 1.49),0.76 (± 2.53), 0.13 (± 0.39), and 2.95 (± 3.02), respectively. The prevalence of dental caries and periodontal disease was 85.7% and 93.5%, respectively. The oral hygiene status was poor in 45.9% of the study participants. This study demonstrates poor oral hygiene and high prevalence of periodontal diseases and dental caries as well as a large proportion of unmet dental needs among the laborers of Gunj marketing yard.

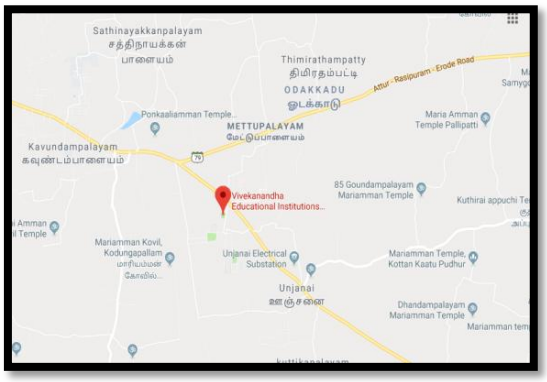
MATERIALS AND METHODS

BRIEF PROFILE OF THE STUDY POPULATION

A descriptive cross sectional study was conducted to assess the oral health status and treatment needs among elementary workers of Vivekanandha educational institution at Tiruchengode, Nammakkal District, Tamil Nadu, South India. There were about 1500 elementary workers in the educational institution. Among them the study included 600 elementary workers.

INFORMATION ABOUT STUDY AREA

Tiruchengode is a town in Nammakkal district of Tamil Nadu state in South India. It is fast emerging as a hub for preparing aspirants to professional courses. Hence, the transformation of Namakakal, basically a dry land countryside, into a seat of many educational institutions. These institutions involved a huge number of elementary workers, who involve in activities like cleaning; restocking supplies; performing basic maintenance in hostels, kitchen, office and other buildings; helping in kitchen and simple task in food preparation; delivering message or goods, sweepers, and so on.



SCHEDULE OF THE SURVEY:

A survey was systematically scheduled to cover the required sample of elementary workers according to the convenience of the institutional authorities. The

survey period from 1st January 2017 to 30th June 2017. A detailed weekly schedule was prepared well in advance by informing the authorities of respective department. Although a detailed schedule plan was prepared meticulously, few adjustment and changes were called for while working it out practically.

PILOT STUDY:

A pilot study was undertaken during January 2017 in the educational institution, to determine the feasibility of the study, assess the validity and accuracy of the predesigned questionnaire, the reliability of the examiner and to know the practical and communication difficulties while examining the oral cavity of this group of subjects. The study was conducted on 100 elementary workers. Questionnaire was used to assess the years of working experience, tobacco usage and alcohol consumption, and oral hygiene practices. WHO oral health assessment form 1997 was used to assess the oral health status and treatment needs. It took an average of 15-20 minutes to complete the survey performa and clinical examination. The intra reliability of the examiner was assessed by using the weighed kappa statistics which was α=0.83 for CPI and 0.74 for DMFT.

INCLUSION CRITERIA

Elementary workers aged 18 years and above who were present on the day of examination and who were willing to participate in the study were included.

EXCLUSION CRITERIA

Workers those who were not willing to give informed consent and not present during the study period.

SAMPLE SIZE:

Sample size calculation was done using the formula given below.

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

Description: n = required sample size

t = confidence level of 95% (standard value of 1.96)

p = Expected Frequency of the Factor under Study-40%

m = margin of error of 4% (standard value of 0.04)

$$n = \frac{1.96^2 \times 0.40(1-0.40)}{.04^2} = 576$$

Contingency: The sample is further increased by 5% to account for contingencies such as non-response or recording error.

n +5 % = 576 + 5% = 605

Samples Round off: 600 samples

The study sample of 600 elementary workers were selected from the list of elementary workers appointed in the educational institution using simple random sampling method.

ETHICAL CLEARANCE

Ethical clearance to conduct the study was obtained from the Institution Review Board of Vivekanandha Dental College for Women. (**Annexure -I)**.

INSTITUTIONAL CONSENT & INFORMED CONSENT

Permission was also obtained from the authority of the educational institution to conduct the study (**Annexure - II to IV**). Informed consent was also obtained from individual subject prior to examination. (**Annexure - V & VI)**

CALIBRATION AND TRAINING OF EXAMINER:

To ensure uniform interpretation, understanding and application by the examiner, of the codes and criteria for the various diseases and conditions to be

observed and recorded in the performa used, the examiner was priory calibrated and trained in the department. The recorder in the study was also priory trained in the department.

Duplicate examination was conducted for 5% of the sample at the beginning and again on successive days using same diagnostic criteria to ensure the reliability of the examiner. The intra reliability of the examiner was assessed by using the weighed kappa statistics which was α =0.83 for CPI and 0.74 for DMFT.

ARMAMENTARIUM

Examination was carried out with the help of the following (**Photograph 1**):

- Mouth mirrors
- WHO probe
- Cotton rolls
- Kidney trays
- Disinfecting solution
- Chip blower
- Cotton holder
- Disposable gloves and masks
- Stainless steel trays

The presterilized instruments were properly packed and carried to the institutes in sufficient numbers to avoid the interruption during examination.

INFECTION CONTROL

During data collection, chemical method of disinfection using Korsolex (Active ingredients in 100 g: Glutaral 15.2 g; (ethylendioxy) dimethanol19.7 g) diluted by adding water was used. Used instruments were washed and placed in the

disinfectant solution, then re-washed and drained well. After each day of examination, the entire set of instruments was autoclaved.

PERFORMADETAILS and METHOD OF OBTAINING DATA:

Data was collected from a cross-sectional survey, using a Survey Performa which comprised of a Questionnaire and Clinical examination.

A pre-tested questionnaire which included Demographic data, years of working experience, tobacco habits, and oral hygiene practices, was collected from the individuals prior to the clinical examination. (**Annexure – VIIa & VIIb**)

An intra-oral examination was carried out by a single examiner to assess the Oral Health Status and treatment needs using WHO Oral Health Assessment Form (1997) (**Annexure - VIII**).

CLINICAL ASSESSMENT AND DATA COLLECTION

The examiner visited the institutional premises on the predetermined dates as according to the schedule with a trained recorder, where the recorder recorded the general information and the clinical examination finding as directed by the examiner. The trained data recorder was on the left side of the patient, so that data recorder was able to hear the examiner's instructions and codes and also the examiner was able to see the data being entered.

Clinical were carried out with the aid of the mouth mirror, explorer and CPI probe under adequate natural light (Type III Examination). Subject were seated on a chair and oral cavity was examined. The chair was placed in front of a well lighted window, but not in direct sunlight, with the subject facing the window. No artificial dental illumination was used. (**Photograph 2**)

Subjects who were present at the time of the examination of that particular period were only recorded.

STATISTICAL ANALYSIS:

The data obtained was subjected to statistical analysis. The data recorded were transferred and tabulated to the computer - Windows Microsoft Excel (2007) - for the purpose of the data analysis. Statistical Package of Social Science (SPSS Version 20; IBM Chicago Inc., USA) was used for statistical analysis. The total data was subdivided and distributed meaningfully and presented as individual tables along with graphs. The significance level was fixed to be $p \leq 0.05$for the analysis.

Depending upon the nature of the data, the statistical tests were chosen.

1. Categorical data expressed in terms of frequency were analyzed for statistical significance using Chi square test.

2. All continuous data were subjected to Kolmogorov Smirnov test for normality. It was found that the data was normally distributed ($p > 0.05$) and hence parametric tests of significance were used.

3. Independent Sample t test was used to analyze the difference in the means of continuous variables.

4. Analysis Of Variance (ANOVA) was used to test the significance of mean comparison of oral diseases among different age groups.

5. For all comparisons, p value of < 0.05 was considered to be statistically significant.

$p > 0.05$ - Not Significant

$p < 0.05$* - Significant (significant at 95% confidence interval)

$p < 0.01$** - Highly Significant (significant at 99% confidence interval)

$p < 0.001$*** - Very Highly Significant (significant at 99.9% confidence interval)

PHOTOGRAPHS

Photograph 1

Photograph 2

RESULTS

The present study was done to assess the oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode, TamilNadu. The study population consisted of 600 workers, who were involved in various elementary work.

DEMOGRAPHIC DETAILS:

Table 1/Graph 1& 2: Distribution of the study population based on age and gender:

Among 600 study subjects, majority of the study population 198(33%) were ≤ 35 years; 165(27%) between 56-65 years; 130 (22%) between 46 - 56 years; 37(6%) were greater than 65 years and 70(12%) were between 36-45 years based on the age group.

The gender wise distribution of the study population shows that about 411(68%) were males and 189(32%) were females.

Table 2: Distribution of study population based on mean age and gender:

The study population consisted of 411 males (68%) and 189 (32 %) females. The study exhibited a mean age of the 51.37 [±12.31] years and 29.58 [±13.36] years among male and female elementary workers. Independent sample t-test is used to compare gender with the mean age group of the study population.

ORAL MUCOSAL CONDITION:

Table 3 / Graph 3 & 4: Distribution of oral mucosal condition among study population based on age group and gender:

Based on the age group of the study population, about 11(6%), 3(4%), 6(5%), 9(5%) and 3(8%) of them ≤ 35 years, 36 - 45 years, 46 - 55 years, 56 - 65 years and > 65years of age had abnormalities in their oral mucosa respectively.

Based on the gender distribution of the study population it's found that 23(6%) of males and 9(5%) of females had abnormalities in their oral mucosa. The oral mucosal condition did not have any statistical significant relationship within the age groups and gender of the study population.

DENTAL FLUOROSIS:

Table 4 / Graph 5 & 6: Distribution of dental fluorosis among study population based on gender:

Among the study population of 411 males, 30 (7%) had severe fluorosis, 9 (2%) had very mild fluorosis, 3 (1%) had moderate fluorosis, 5 (1%) had mild fluorosis, and remaining 364 (89%) were normal. Among the study population of 189 females 9 (5%) had mild fluorosis; 6 (3%) had moderate fluorosis; 6(3.0%) had very mild fluorosis, 2 (1%) had severe fluorosis, and remaining 166 (88%) were normal. Statically significant difference exist between dental fluorosis and gender.

PERIODONTAL STATUS

Table 5 / Graph 7 & 8: Distribution of periodontal status among study population based on age group and gender:

Among the total study population of 600, subjects of 198 were in the age group of ≤35 years had 62(31%) of healthy periodontium, 23(12%) had bleeding gums, 113(57%) had calculus, no one had pocket 4-5mm and a pocket of 6mm or more. Among the age group of 36 - 45 years, subjects of 70, 14(20%) had healthy periodontium, 11(16%) had bleeding gums, 44(63%) had calculus, 1(1%) had Pocket 4-5mm. Among the age group of 46 - 55 years, 130 subjects 36(28%) had healthy periodontium, 10(8%) had bleeding, 79(61%) had calculus and 2(2%) of them had a pocket 4-5mm. Among the age group of 56 - 65 years, 165 subjects 46 (28%) had

healthy periodontium, 10(6%) had bleeding, 84(51%) had calculus, 1(1%) had periodontal pocket 4-5mm.

Gender wise distribution of CPI Index among the total subjects of 411(69%) males, 107(26%) had healthy periodontium, 27(7%) had bleeding, 236(57%) had calculus, 4(1%) had periodontal pocket 4-5mm. Among the total subjects of 189(32%) females, 58(31%) had healthy periodontium, 28(15%) had bleeding, 100(53%) calculus, 1(1%) had periodontal pocket of 4-5mm. The chisquare test results indicated that, based on age group and gender there was a statistically significant difference was found with periodontal status ($p<0.001$).

Table 6: Distribution of mean number of sextant affected by periodontal disease based on age group & gender:

The table shows that the mean number of sextant with calculus was greater than other three periodontal indicators (3.51± 2.86). Based on the age wise distribution among ≤35 year old workers the mean number of bleeding sextant were 0.79± 1.52,calculus were 2.97± 2.77 and healthy were 2.22± 2.72. In the age group of 36 - 45 year old workers the mean number of bleeding sextant were 0.74± 1.72,calculus were 3.51± 2.86, periodontal pocket of 4-5mm were 0.06± 0.478 and healthy were 1.46± 2.41. Age group of 46 - 55 year old workers the mean number of bleeding sextant were 0.41± 1.27,calculus were 3.23± 2.77, periodontal pocket of 4-5mm were 0.05± 0.391 and healthy were 1.81± 2.56. Among 56 - 65 year old workers the mean number of bleeding sextant were 0.36± 1.36,calculus were 2.61± 2.71, periodontal pocket of 4-5mm were 0.01± 0.16 and healthy were 1.55± 2.43. Above 65 year old workers the mean number of bleeding sextant were 0.08± 0.36,calculus were 2.08± 2.56, periodontal pocket of 4-5mm were 0.05± 0.33 and healthy were 0.92± 1.88. Based on age wise distribution there is statistically

significant difference between healthy, bleeding sextant, calculus and age group with p = < 0.05.

Based on gender wise distribution among males the mean number of bleeding sextant were 0.35± 1.25,calculus were 3.07± 2.78,periodontal pocket of 4-5mm were 0.02± 0.26 and healthy were 1.58± 2.46. Based on age wise distribution there is statistical significance between healthy, bleeding and calculus sextant and age(p <0.05).Based on gender wise distribution there is statistically significant difference between healthy, bleeding sextant and gender with p =<0.05.

LOSS OF ATTACHMENT

Table 7 / Graph 9 & 10: Distribution of loss of attachment among study population based on age group & gender:

Among 600 subjects, in the age group between ≤35 years, 197(99%) had 0 - 3mm of LOA, 1 (1%) had 4 - 5mm of LOA. Among 36 - 45 years, 60(86%) had 0 - 3mm of LOA, 6(9%) had 4 - 5mm of LOA, 1(1%) had 6-8 mm of LOA. In the 46 - 55 years, 78(60%) had 0 - 3mm of LOA, 31(24%) had 4 - 5mm of LOA, 19(15%) had 6-8 mm of LOA, 28(7.84%) had 9 - 11mm of LOA. In the 56 - 65 years, 55(33%) had 0 - 3mm of LOA, 56(34%) had 4 - 5mm of LOA, 31(19%) had 6- 8 mm of LOA, 3(2%) had 9 - 11mm of LOA.

Based on gender wise distribution, 411(69%) of male showed 225(55%) of 0 - 3mm of LOA, 95(23%) had 4 - 5mm of LOA, 55(13%) had 6- 8 mm of LOA, 4(1%) had 9 - 11mm of LOA. Among 189(32%) of female population, 172(91%) had 0 - 3mm of LOA, 8(4%) had 4 - 5mm of LOA, 4(2%) had 6- 8 mm of LOA, 1(1%) had 9 - 11mm of LOA. Statistical significance was found between LOA based on age group and gender.

Table 8: Distribution of mean number of sextant affected by Loss of Attachment based on age group & gender:

Study subjects in the age group ≤ 35 years had mean number with 0-3mm of loss of attachment was 5.96±0.43 and with 4-5mm of loss of attachment was 0.03±0.36. Age group between 36 -45 years had mean number with 0-3mm of loss of attachment was 5.4±1.63, with 4 -5mm was 0.29±1.13,with 6-8 mm was 0.01±0.12. Age group between 46 - 55 years had mean number with 0-3 mm of loss of attachment was 4.21±2.40, with 4 -5 mm was 0.8±1.53, with 6-8mm was 0.5±1.443,with 9-11mm was 0.02±0.12. Age group between 56 - 65 years had mean number with 0-3mm of loss of attachment was 2.21±2.54, with 4 - 5mm of loss of attachment 1.52±2.15 with 9-11mm of loss of attachment was 0.04±0.34.

Among the study subjects, mean number based on gender distribution the males with LOA 0-3mm was 3.6±2.68, with LOA 4-5mm was 0.95±1.774, and with LOA 6- 8 mm was 0.47±1.43, LOA 9-11mm was 0.02±0.24. Among the females the mean number of sextants with LOA 0-3mm was 5.51±1.603, with LOA 4-5mm was 0.17±0.807, with LOA 6- 8 mm 0.11±0.67 and with LOA 9-11mm was 0.01±0.07.

DENTITION STATUS:

Table 9 / Graph 11: Distribution of dentition status among study population based on gender:

Among the subjects of 289(48%) about 92 (49%) females and 197 (48%) males had decayed teeth. Only 40(7%) of elementary workers had filled teeth without decay among which 26 (6%) and 14(7%) were male and female respectively. Among 160 (27%) subjects 118 (29%) males and 42 (22%) females had teeth missing due to caries. Among 125 (21%) workers 117 (28%) males and 8 (4%) females had teeth missing due to reason other than dental caries. Among 16 (3%) subjects 13 (3%) male

and 3(2%) females had Bridge abutment/crown/ veneer/ implant respectively. Among 83 (14%) subjects, 18(4%) male and 65 (34%) female had unerupted teeth.

DISTRIBUTION OF DECAYED TEETH

Table10/Graph 12: Distribution of decayed teeth among study population based on age:

Age group of < 35 years showed the highest prevalence of decayed teeth 103(52%), followed by 46-55 years showed 69(53%) the age group, 56 - 65 years showed 65(39%), 36 - 45 years showed 35(50%) and > 65 years 17(46%).Results shows that there is statistical significance between age and decayed teeth among the workers.

Table 11: Distribution of the mean dental caries experience (DT, MT, FT& DMFT) based on age group & gender:

This table reveals age wise & gender wise mean distribution of decayed teeth, filled teeth, missing teeth and mean DMFT according to age group and gender. Mean dental caries experiences were increasing with increase in age. Mean DMFT was seen highest (4.43±6.805) in > 65 years age groups. Mean DMFT was 3.37±4.685 in female as compared to 3.23±4.676 in male**.** Among the study subjects highest mean number of filled teeth showed 0.63±1.859 and highest mean number of missing teeth showed 3.24±6.942 in the age group of 36 - 45 years and > 65 years respectively. Total mean DT was 1.64, mean MT was 1.425, mean FT was 0.235 and total mean DMFT was in male 3.23±4.676 and 3.37±4.685 in female. Overall mean DMFT was 3.3±4.6805. Mean dental caries experiences shows statistical significant difference between age group (p=<0.05) in relation to DT, MT. based on total mean DMFT.

OVERALL TREATMENT NEEDS:

Table 12 / Graph 13 & 14: Distribution of overall treatment needs among study population based on gender:

About 215(35.8%), 41(6.8%), 2(0.3%), 24(4%), 123(20.5%) and 215(35.6%) of the study participant required one surface restoration, two surface restoration, crown for any reason, pulp care, extraction and other care. Out of the 215(35.8%) who required one surface restoration 136(33.1%) were males and 79(41.8%) were females. Among 41(6.8%) who required two surface restoration 32(7.8%) were males and 9(4.8%) were females. Only 2(0.3%) required crown.Out of the total 24(4%) requiring pulp care 18(4.4%) males and 6(3.2%) females. Among 123(20.5%) who required extraction 97(23.6%) were males and 26(13.8%) were females.

Table 13: Distribution of mean overall treatment needs among study population based on age group and gender:

The mean of the treatment needs among the study participants were 1.07±2.04, 0.12±0.54, 0±0.05, 0.06±0.47 and 0.50±1.35 for one surface restoration, two surface restoration, crown for any reason, pulp care and extraction respectively.

PROSTHETIC STATUS

Table 14 / Graph 15, 16, 17 & 18: Distribution of prosthetic status in upper & lower arch based on age group and gender:

Upper prosthetic status:

Distribution of upper prosthetic status based on the gender, Among male 393(95.6%) did not have any prosthesis while none of the female study participant 189(100%) had prosthesis. In males only 10 (2.4%) had upper partial denture and Full removable denture. About 5 (1.2%) of the male had upper prosthetic bridge**.**

Distribution of upper prosthetic status based on the age, Among <35 and 36-45 years age group elementary workers did not have any prosthesis. Among 46 - 55 years age group 124(95.4%) did not have any prosthesis, 3(2.3%) had bridge, 2(1.5%) had partial denture and 1(0.8%) had Full removable denture. Among 56 - 65 years age group 156(94.5%) did not have any prosthesis, 1(0.6%) had bridge, 1(0.6%) had partial denture and 7(4.2%) had Full removable denture. In participants of age group >65 years 34(91.9%) did not have any prosthesis, 1(2.7%) had bridge and 2(5.4%) had Full removable denture.

Lower prosthetic status:

Distribution of lower prosthetic status based on the age, in which < 35 years age group of 197(99.5%) did not had any prosthesis and only one 1(0.5%) had a partial denture. Among 36-45 years age group all 70(100%) did not have any prosthesis. In the age group of 46 - 56 years 128(98.5%) subjects did not had any prosthesis, 1(0.8%) had a bridge and 1(0.8%) had a Full removable denture . Among 56 - 65 years age group 155(93.9%) did not had any prosthesis, 1(0.5%) had more than one bridge, 3(2%) had partial denture and 6(3.6%) had Full removable denture. Above > 65 years age group 35(94.6%) did not had any prosthesis and 2(5.4%) had Full removable denture.

Distribution of lower prosthetic status based on the gender, Male subjects of 397(96.6%) did not had any prosthesis. Only 1(0.2%) in male had a bridge / more than one bridge and 3(0.7%) partial denture in lower arch. About males 9(2.2%) had full removable denture. About 188(100%) of the females had no prosthesis and only 1(0.5%) had a partial denture in lower arch.

PROSTHETIC NEEDS:

Table 15 / Graph 19, 20, 21 & 22: Distribution of prosthetic needs in upper & lower arch based on age group and gender:

Upper prosthetic needs:

Distribution of upper prosthetic needs based on the age:

In the age group of < 35 years, 194(98%) no prosthesis was needed, 1(0.5%) needed one unit prosthesis, 3(1.5%) needed multi-unit prosthesis. Among the age group distribution between 36-45 years, 54(77.1%) needed no prosthesis, 9(12.9%) needed one unit prosthesis and 7(10%) needed a multi unit prosthesis. Among the age group distribution, 46-55 years 96(74.6%) no prosthesis was needed, 13(10%) needed one unit prosthesis, 18(13.8%) needed multi-unit prosthesis and 2(1.5%) needed full prosthesis. Among the age group distribution of 56-65 years, 96(58.2%) needed no prosthesis, 17(10.3%) needed one unit prosthesis, 37(22.4%) needed a multi unit prosthesis and 15(9.1%) needed full prosthesis. In the age group distribution of > 65 years, 10(27%) needed no prosthesis, 3(8.1%) needed one unit prosthesis, 14(37.8%) needed a multi unit prosthesis and 10(27%) needed full prosthesis.

Distribution of upper prosthetic needs based on the gender:

Based on gender wise distribution, 284(69.1%) of male do not need any prosthesis, 33(8%) needed one unit prosthesis, 69(16.8%) needed multi-unit prosthesis, and 25(6.1%) needed full prosthesis. Among the female distribution 167(88.4%) subjects do not need any prosthesis, 10(5.3%) needed one unit prosthesis, 10(5.3%) needed multi-unit prosthesis and 2(1.1%) needed full prosthesis**.** Results shows statistical significance between age and upper prosthetic needs with p– value less than 0.001.

Lower prosthetic needs:

Distribution of lower prosthetic needs based on the age:

Based on the age group distribution, <35 years 186(93.9%) no prosthesis needed, 9(4.5%) needed one unit prosthesis, 3(1.5%) needed a multi unit prosthesis. Among the age group distribution of 36-45 years, 52(74.3%) no prosthesis needed, 4(5.7%) needed one unit prosthesis, 14(20%) needed a multi unit prosthesis and 7(0.93%) needed full prosthesis. Among the age group distribution, 46-55 years 91(70%) no prosthesis needed, 12(9.2%) needed one unit prosthesis, 25(19.2%) needed multi-unit prosthesis and 2(0.3%) needed full prosthesis. Among the age group distribution of 56-65 years, 83(50.3%) no prosthesis needed, 21(12.7%) needed one unit prosthesis, 47(28.5%) needed multi-unit prosthesis and 14(8.5%) needed full prosthesis. Among > 65 years of age group 10(27%) no prosthesis needed, 4(10.8%) needed one unit prosthesis, 13(35.1%) needed multi-unit prosthesis and 10(27%) needed full prosthesis.

Distribution of lower prosthetic needs based on the gender:

Based on gender wise distribution 267(65%) males do not need any prosthesis, 37(9%) needed one unit prosthesis, 83(20.2%) needed for multi-unit prosthesis and 24(5.8%) needed full prosthesis. Among females, 155(82%) do not need any prosthesis, 13(6.9%) needed one unit prosthesis, 19(10.1%) needed multi unit prosthesis and 2(1.1%) needed full prosthesis. Based on prosthetic needs of lower arch present study showed statistically significant ($p < 0.001$) with age.

ORAL HYGIENE PRACTICES

Table 16 / Graph 23: Distribution of oral hygiene practices among study population based on age group and gender:

Majority of the study population of about 428(71.3%) were using tooth brush and tooth paste for brushing their teeth among which 273(66.4%) and 155(82%) were male and female respectively. About 114(19%) subjects were Neem sticks among which 89(21.7%) were males and 25(13.2%) were females. Subjects of 26(4.3%) were using finger and tooth powder to clean their teeth of which 19(4.6%) were males and 7(3.7%) were females. About 19.5 % of subjects were using charcoal, salt, brick powder, neem stick as their other tooth cleaning materials.

Table 17: Distribution of oral hygiene materials among study population based on age group and gender:

Majority of the study subjects of about 289(48.2%) were used horizontal method of cleaning, 24(4%) used vertical method, 11(1.8%) used circular method and 106(17.7%) used a combination of all the methods. The study showed about 506(84.3%) of elementary workers brushed their teeth once a daily and only 61(10.2%) brushed twice daily.

TOBACCO AND ALCOHOL CONSUMPTION:

Table 18 / Graph 24: Distribution of tobacco and alcohol consumption habits among study population based on age group and gender:

Among 600 study participants, 170(28.3%) had the habit of Tobacco consumption (either smoking or smokeless form of tobacco or even both). While 13(2.2%) had the habit of Alcohol consumption. About 38(6.3%) had the habit of both tobacco and alcohol consumption.

According to the age group it was found that among subjects of less than 35 years, 35(17.7%) had habit of tobacco consumption, 1(0.5%) had habit of alcohol consumption and 3(1.%) had habit of both. In age group of 36 - 45 years 12(17.1%) had habit of tobacco consumption, 3(4.3%) had habit of alcohol consumption and 4(5.7%) had habit of both. Among the age group of 46-55 years 41(31.5%) had habit of tobacco consumption, 2(1.5%) had habit of alcohol consumption and 10(7.7%) had habit of both. Subjects of 56 - 65years, 66(40%) had habit of tobacco consumption, 6(3.6%) had habit of alcohol consumption and 17(10.3%) had habit of both.

According to the gender it was found that male were prone for various habits of tobacco, alcohol and both. Only 44(28.3%) of the females had the habit of chewing tobacco.

TABLES

Table 1: Distribution of study population based on age and gender

Age in Years	Gender			χ^2test value	p value
	Male	Female	Total		
	n(%)	n(%)	n(%)		
≤ 35	59(14%)	139(74%)	198(33%)	2.175	< 0.05*
36 - 45	49(12%)	21(11%)	70(12%)		
46 - 55	117(28%)	13(7%)	130(22%)		
56 - 65	151(37%)	14(7%)	165(27%)		
> 65	35(9%)	2(1%)	37(6%)		
Total	411(100%)	189(100%)	600(100%)		

Table 2: Distribution of study population based on mean age and gender

Gender	n (%)	μ±SD	t- value	p-Value
Male	411(68%)	51.37±12.31	5.616	< 0.05*
Female	189(32%)	29.58±13.36		
Total	600	44.5±16.2		

Table 3: Distribution of Oral mucosal condition among study population based on age group and gender

		Normal	Abnormalities	χ^2test value	p-Value
		n (%)	n (%)		
Age in Years	≤ 35	187(94%)	11(6%)	12.673	> 0.05
	36 - 45	67(96%)	3(4%)		
	46 - 55	124(95%)	6(5%)		
	56 - 65	156(95%)	9(5%)		
	> 65	34(92%)	3(8%)		
Gender	Male	388(94%)	23(6%)	3.699	> 0.05
	Female	180(95%)	9(5%)		

Table 4: Distribution of dental fluorosis among study population based on gender

Dental Fluorosis	Gender			χ^2test value	P value
	Male	Female	Total		
	n(%)	n(%)	n(%)		
Normal	364(89%)	166(88%)	529(88%)	24.28	<0.001***
Very mild	9(2%)	6(3%)	15(3%)		
Mild	5(1%)	9(5%)	14(2%)		
Moderate	3(1%)	6(3%)	9(2%)		
Severe	30(7%)	2(1%)	32(5%)		
Total	411(100%)	189(100%)	600(100%)		

Table 5: Distribution of periodontal status among study population based on age group and gender

		Healthy	Bleeding	Calculus	Pocket 4-5mm	χ^2 test value	p-Value
		N (%)	N (%)	N (%)	N (%)		
Age in Years	≤ 35	62(31%)	23(12%)	113(57%)	0	41.29	< 0.001***
	36 - 45	14(20%)	11(16%)	44(63%)	1(1%)		
	46 - 55	36(28%)	10(8%)	79(61%)	2(2%)		
	56 - 65	46(28%)	10(6%)	84(51%)	1(1%)		
	> 65	7(19%)	1(3%)	16(43%)	1(3%)		
Gender	Male	107(26%)	27(7%)	236(57%)	4(1%)	2.058	< 0.001***
	Female	58(31%)	28(15%)	100(53%)	1(1%)		

Table 6: Distribution of mean number of sextant affected by periodontal disease based on age group and gender

		CPI-Healthy	CPI-Bleeding	CPI-Calculus	CPI-Pocket 4-5mm
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age in Years	≤ 35	2.22± 2.72	0.79± 1.52	2.97± 2.77	0± 0
	36 - 45	1.46± 2.41	0.74± 1.72	3.51± 2.86	0.06± 0.478
	46 - 55	1.81± 2.56	0.41± 1.27	3.23± 2.77	0.05± 0.391
	56 - 65	1.55± 2.43	0.36± 1.36	2.61± 2.71	0.01± 0.16
	> 65	0.92± 1.88	0.08± 0.36	2.08± 2.56	0.05± 0.33
	ANOVA value	22.265	11.02	41.35	2.58
	p-value	0.012**	0.004**	0.034*	0.372
Gender	Male	1.58± 2.46	0.35± 1.25	3.07± 2.78	0.02± 0.26
	Female	2.2± 2.68	0.96± 1.66	2.65± 2.72	0.02± 0.29
	t- value	17.24	11.58	0.07	1.95
	p-value	0.006**	0.001***	0.080	0.894

Table 7: Distribution of loss of attachment among study population based on age group and gender

		Loss of attachment						p value
		0 - 3mm	**4-5mm**	**6-8mm**	**9 - 11mm**	**12mm**	**χ^2 test value**	
		N (%)	N (%)	N (%)	N (%)	N (%)		
Age in Years	≤ 35	197(99%)	1 (1%)	0	0	0	16.117	< 0.001***
	36 - 45	60(86%)	6 (9%)	1(1%)	0(0%)	1(1%)		
	46 - 55	78(60%)	31(24%)	19(15%)	1(1%)	0		
	56 - 65	55(33%)	56(34%)	31(19%)	3(2%)	0		
	> 65	7(19%)	9(24%)	8(22%)	1(3%)	0		
Gender	Male	225(55%)	95(23%)	55(13%)	4(1%)	0	4.625	< 0.001***
	Female	172(91%)	8(4%)	4(2%)	1(1%)	1(1%)		

Table 8: Distribution of mean number of sextant affected by Loss of Attachment based on age group and gender

		Loss of attachment				
		0 - 3mm	**4-5mm**	**6 - 8mm**	**9 - 11mm**	**12mm**
		Mean ± SD	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Age in Years	≤ 35	5.96±0.43	0.03±0.36	0±0	0±0	0±0
	36 - 45	5.4±1.63	0.29±1.13	0.01±0.12	0±0	0.09±0.72
	46 - 55	4.21±2.40	0.8±1.53	0.5±1.443	0.02±0.12	0±0
	56 - 65	2.21±2.54	1.52±2.15	0.76±1.80	0.04±0.34	0±0
	> 65	1.35±2.32	1.14±1.67	0.59±1.40	0.05±0.33	0±0
	ANOVA value	15.45	49.78	17.45	0.58	0.12
	p-value	0.001***	0.001***	0.001***	0.226	0.108
Gender	Male	3.6±2.68	0.95±1.774	0.47±1.43	0.02±0.24	0±0
	Female	5.51±1.603	0.17±0.807	0.11±0.67	0.01±0.07	0.03±0.44
	t value	254.54	5.89	55.78	3.46	45.81
	p-value	0.001***	0.001***	0.001***	0.287	0.140

Table 9: Distribution of dentition status among study population based on gender

Dentition Status		Gender						
		Male		Female		Total		p value
		N	(%)	N(%)	(%)	N(%)	(%)	
Decayed	Present	197	48%	92	49%	289	48%	< 0.05*
	No	214	52%	97	51%	311	52%	
	Total	411	100%	189	100%	600	100%	
Filled with Decay	Yes	2	0%	0	0%	2	0%	< 0.05*
	No	409	100%	189	100%	598	100%	
	Total	411	100%	189	100%	600	100%	
Filled with out Decay	Yes	26	6%	14	7%	40	7%	< 0.05*
	No	385	94%	175	93%	560	93%	
	Total	411	100%	189	100%	600	100%	
Missing due to caries	Yes	118	29%	42	22%	160	27%	< 0.05*
	No	293	71%	147	78%	440	73%	
	Total	411	100%	189	100%	600	100%	
Missing other reasons	Yes	117	28%	8	4%	125	21%	< 0.001***
	No	294	72%	181	96%	475	79%	
	Total	411	100%	189	100%	600	100%	
Bridge abutment / crown / veneer / implant	Yes	13	3%	3	2%	16	3%	< 0.05*
	No	398	97%	186	98%	584	97%	
	Total	411	100%	189	100%	600	100%	
Unerupted tooth	Yes	18	4%	65	34%	83	14%	< 0.001***
	No	393	96%	124	66%	517	86%	
	Total	411	100%	189	100%	600	100%	

Table 10: Distribution of decayed teeth among study population based on age

Age in Years	Decayed Tooth			χ^2test value	p value
	Present	**Absent**	**Total**	20.713	**< 0.05***
	N(%)	N(%)	N(%)		
≤ 35	103(52%)	95(48%)	198(100%)		
36 - 45	35(50%)	35(50%)	70(100%)		
46 - 55	69(53%)	61(47%)	130(100%)		
56 - 65	65(39%)	100(61%)	165(100%)		
> 65	17(46%)	20(54%)	37(100%)		
Total	289	311	600		

Table 11: Distribution of the mean dental caries experience (DT, MT, FT & DMFT) based on age group & gender

		DT	**MT**	**FT**	**DMFT**
		Mean ± SD	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Age in Years	≤ 35	1.71±2.4	0.17±0.619	0.2±0.97	2.08±2.567
	36 - 45	2.13±3.522	1.34±2.713	0.63±1.859	4.1±4.247
	46 - 55	1.62±2.491	1.24±2.912	0.2±0.782	3.06±3.737
	56 - 65	1.14±1.928	3.03±6.095	0.09±0.642	4.26±6.313
	> 65	1.14±1.601	3.24±6.942	0.05±0.229	4.43±6.805
	p- value	<0.05*	<0.001***	<0.01**	<0.001***
Gender	Male	1.39±2.122	1.67±4.291	0.17±0.864	3.23±4.676
	Female	1.89±2.987	1.18±3.849	0.3±1.215	3.37±4.685
	p-value	<0.05*	>0.05	>0.05	>0.05

Table 12: Distribution of overall treatment needs among study population based on gender

Treatment needs		Gender		
		Male	Female	Total
		N(%)	N(%)	N(%)
One surface restoration	Yes	136(33.1%)	79(41.8%)	215(35.8%)
	No	275(66.9%)	110(58.2%)	385(64.2%)
	Total	411(100%)	189(100%)	600(100%)
Two surface restoration	Yes	32(7.8%)	9(4.8%)	41(6.8%)
	No	379(92.2%)	180(95.2%)	559(93.2%)
	Total	411(100%)	189(100%)	600(100%)
Crown for any reason	Yes	1(0.2%)	1(0.5%)	2(0.3%)
	No	410(99.8%)	188(0.55)	598(99.7%)
	Total	411(100%)	189(100%)	600(100%)
Pulp care	Yes	18(4.4%)	6(3.2%)	24(4%)
	No	393((95.6%)	183(96.8%)	576(96%)
	Total	411(100%)	189(100%)	600(100%)
Extraction	Yes	97(23.6%)	26(13.8%)	123(20.5%)
	No	314(76.4%)	163(86.2%)	477(79.5%)
	Total	411(100%)	189(100%)	600(100%)
Need for other care	Yes	179(43.6%)	36(19%)	215(35.8%)
	No	228(55.5%)	153(81%)	381(63.5%)
	Total	411(100%)	189(100%)	600(100%)

Table 13: Distribution of mean overall treatment needs among study population based on age group and gender

		One surface restoration	Two surface restoration	Crown for any reason	Pulp care & restoration	Extraction
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age in Years	≤ 35	1.49±2.130	.06±.306	0.01±.100	0.04±0.222	0.18±0.745
	36 - 45	1.67±3.020	0.06±0.289	0.00±0.00	0.04±0.266	0.46±1.674
	46 - 55	0.92±2.045	0.15±0.558	0.00±0.00	0.06±0.299	0.85±1.792
	56 - 65	0.52±1.309	0.19±0.818	0.00±0.00	0.10±0.806	0.58±1.375
	> 65	0.68±1.180	0.11±0.315	0.00±0.00	0.05±0.229	0.62±0.982
	Total	1.07±2.048	0.12±0.548	0±0.058	0.06±0.474	0.50±1.355
Gender	Male	0.88±1.813	0.15±0.635	0.00±0.049	0.07±0.548	0.55±1.33
	Female	1.48±2.440	0.05±0.268	0.01±0.073	0.04±0.249	0.38±1.404
	Total	1.07±2.048	0.12±0.548	0±0.058	0.06±0.474	0.50±1.355

Table 14: Distribution of prosthetic status in upper & lower arch based on age group and gender

		Prosthetic status									
		Prosthetic status upper					**Prosthetic status lower**				
		No prosthesis	**Bridge**	**More than one bridge**	**Partial denture**	**FRD**	**No prosthesis**	**Bridge**	**More than one bridge**	**Partial denture**	**FRD**
		N(%)	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**
Age in Years	≤ 35	198(100%)	0	0	0	0	197(99.5%)	0	0	1(0.5%)	0
	36 - 45	70(100%)	0	0	0	0	70(100%)	0	0	0	0
	46 - 55	124(95.4%)	3(2.3%)	0	2(1.5%)	1(0.8%)	128(98.5%)	1(0.8%)	0	0	1(0.8%)
	56 - 65	156(94.5%)	1(0.6%)	0	1(0.6%)	7(4.2%)	155(93.9%)	0	1(0.5%)	3(2%)	6(3.6%)
	> 65	34(91.9%)	1(2.7%)	0	0	2(5.4%)	35(94.6%)	0	0	0	2(5.4%)
	χ^2 value	26.896					24.841				
	p- value	0.008**					0.073				
Gender	Male	393(95.6%)	5(1.2%)	3(0.7%)	10(2.4%)	10(2.4%)	397(96.6%)	1(0.2%)	1(0.2%)	3(0.7%)	9(2.2%)
	Female	189(100%)	0	0	0	0	188(99.5%)	0	0	1(0.5%)	0
	χ^2 value	8.533					5.247				
	p-value	0.003**					0.263				

Table 15: Distribution of prosthetic needs in upper & lower arch based on age group and gender

		Prosthetic needs							
		Prosthetic needs upper				**Prosthetic needs lower**			
		No prosthesis needs	**Need for one unit prosthesis**	**Need for multi unit prosthesis**	**Need for full prosthesis**	**No prosthesis needs**	**Need for one unit prosthesis**	**Need for multi unit prosthesis**	**Need for full prosthesis**
		N(%)	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**	**N(%)**
Age in Years	≤ 35	194(98%)	1(0.5%)	3(1.5%)	0(0%)	186(93.9%)	9(4.5%)	3(1.5%)	0(0%)
	36 - 45	54(77.1%)	9(12.9%)	7(10%)	0(0%)	52(74.3%)	4(5.7%)	14(20%)	0(0%)
	46 - 55	96(74.6%)	13(10%)	18(13.8%)	2(1.5%)	91(70%)	12(9.2%)	25(19.2%)	2(0.3%))
	56 - 65	96(58.2%)	17(10.3%)	37(22.4%)	15(9.1%)	83(50.3%)	21(12.7%)	47(28.5%)	14(8.5%)
	> 65	10(27%)	3(8.1%)	14(37.8%)	10(27%)	10(27%)	4(10.8%)	13(35.1%)	10(27%)
	χ^2 value	16.362				15.652			
	p- value	0.001***				0.001***			
Gender	Male	284(69.1%)	33(8%)	69(16.8%)	25(6.1%)	267(65%)	37(9%)	83(20.2%)	24(5.8%)
	Female	167(88.4%)	10(5.3%)	10(5.3%)	2(1.1%)	155(82%)	13(6.9%)	19(10.1%)	2(1.1%)
	χ^2 value	28.005				20.713			
	p-value	0.001***				0.001***			

Table 16: Distribution of oral hygiene practices among study population based on age group and gender

		Method of brushing				Frequency of brushing			
		Horizontal	**Vertical**	**Circular**	**Combination**	**Occasionally**	**Once**	**Twice**	**>2 times**
Age in Years	≤ 35	118(59.6%)	14(7.1%)	8(4%)	44(22.2%)	3(1.5%)	156(78.8%)	38(19.2%)	1(0.5%)
	36 - 45	39(55.7%)	3(4.3%)	3(4.3%)	8(11.4%)	1(1.4%)	66(94.3%)	3(4.3%)	0
	46 - 55	61(46.9%)	4(3.1%)	0	27(20.8%)	0	123(94.6%)	6(4.6%)	0
	56 - 65	59(35.8%)	3(1.8%)	0	22(13.3%)	0	136(82.4%)	11(6.7%)	0
	> 65	12(32.4%)	0	0	5(13.5%)	0	25(67.6%)	3(8.1%)	0
	Total	289(48.2%)	24(4%)	11(1.8%)	106(17.7%)	4(0.7%)	506(84.3%)	61(10.2%)	1(0.2%)
Gender	Male	188(45.7%)	11(2.7%)	2(0.5%)	74(18%)	2(0.5%)	354(86.1%)	27(6.6%)	0
	Female	101(53.4%)	13(6.9)	9(4.8%)	32(16.9%)	2(1.1%)	152(80.4%)	34(18%)	1(0.5%)
	Total	289(48.2%)	24(4%)	11(1.8%)	106(17.7%)	4(0.7%)	506(84.3%)	61(10.2%)	1(0.2%)

Table 17: Distribution of oral hygiene materials among study population based on age group and gender

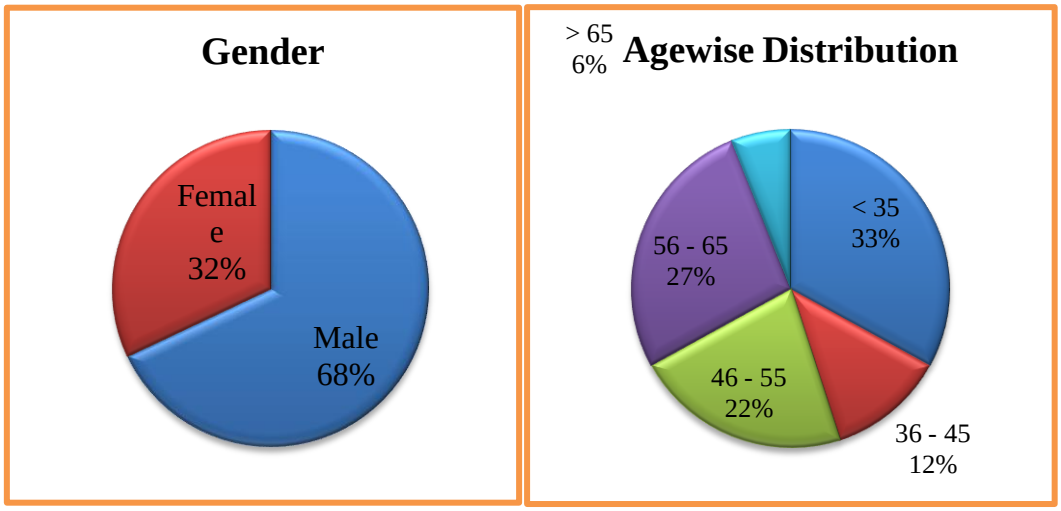
Material for brushing							
		Neem Stick	**Charcoal**	**Finger And tooth Powder**	**Finger And Brick Powder**	**Tooth brush and tooth paste**	**Tooth brush and tooth powder**
Age in Years	≤ 35	12(6.1%)	0	3(1.5%)	0	183(92.4%)	0
	36 - 45	12(17.1%)	1(1.4%)	4(5.7%)	0	53(75.7%)	0
	46 - 55	32(24.6%)	1(0.8%)	5(3.8%)	0	91(70%)	0
	56 - 65	52(31.5%)	0	9(5.5%)	1(0.6%)	84(50.9%)	1(0.6%)
	> 65	6(16.2%)	0	5(13.5%)	0	17(45.9%)	0
	Total	114(19%)	2(0.3%)	26(4.3%)	1(0.2%)	428(71.3%)	1(0.2%)
Gender	Male	89(21.7%)	1(0.2%)	19(4.6%)	1(0.2%)	273(66.4%)	0
	Female	25(13.2%)	1(0.2%)	7(3.7%)	0	155(82%)	1(0.5%)
	Total	114(19%)	2(0.3%)	26(4.3%)	1(0.2%)	428(71.3%)	1(0.2%)

Table 18: Distribution of tobacco and alcohol consumption habits among study population based on age group and gender

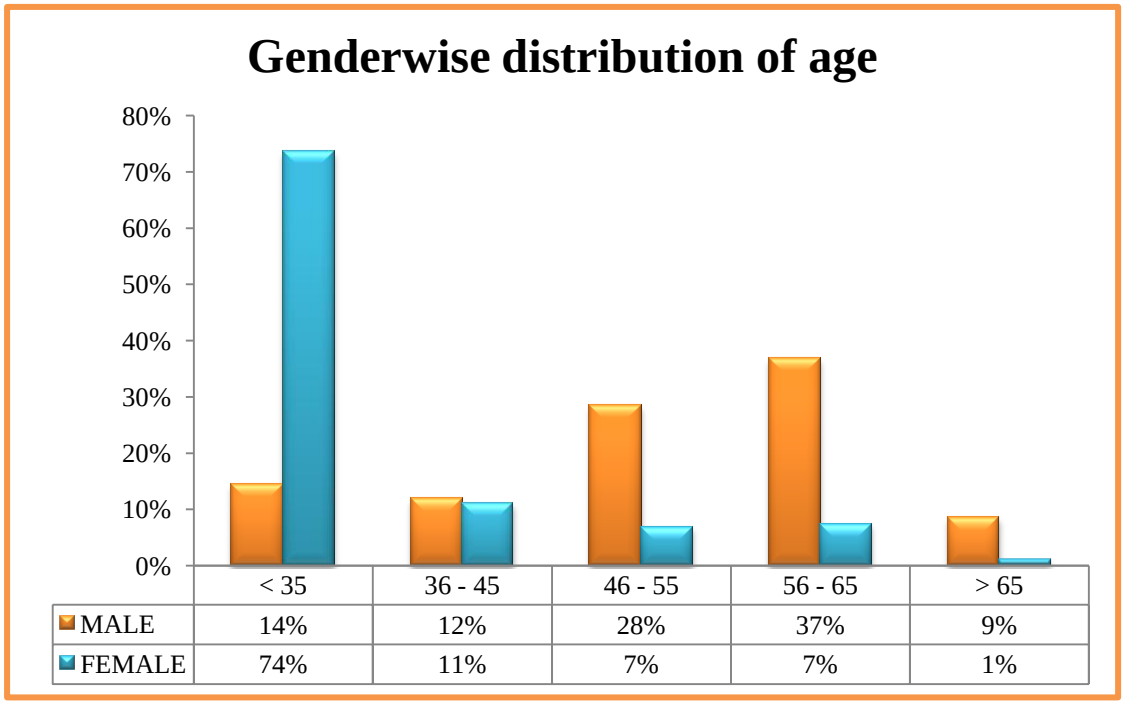
Habit present						
		Tobacco	**Alcohol**	**Both**	**None**	**Total**
Age in Years	≤ 35	35(17.7%)	1(0.5%)	3(1.5%)	159(80.3%)	198(100%)
	36 - 45	12(17.1%)	3(4.3%)	4(5.7%)	51(13.5%)	70(100%)
	46 - 55	41(31.5%)	2(1.5%)	10(7.7%)	77(20.3%)	130(100%)
	56 - 65	66(40%)	6(3.6%)	17(10.3%)	76(46.1%)	165(100%)
	> 65	16(43.2%)	1(2.7%)	4(10.8%)	16(43.2%)	37(100%)
	Total	170(28.3%)	13(2.2%)	38(6.3%)	379(63.2%)	600(100%)
Gender	Male	126(30.7%)	13(3.2%)	38(9.2%)	234(56.9%)	411(100%)
	Female	44(28.3%)	0	0	145(76.7%)	189(100%)
	Total	170(28.3%)	13(2.2%)	38(6.3%)	379(63.2%)	600(100%)

GRAPHS

Graph 1: Distribution of study population based on age and gender

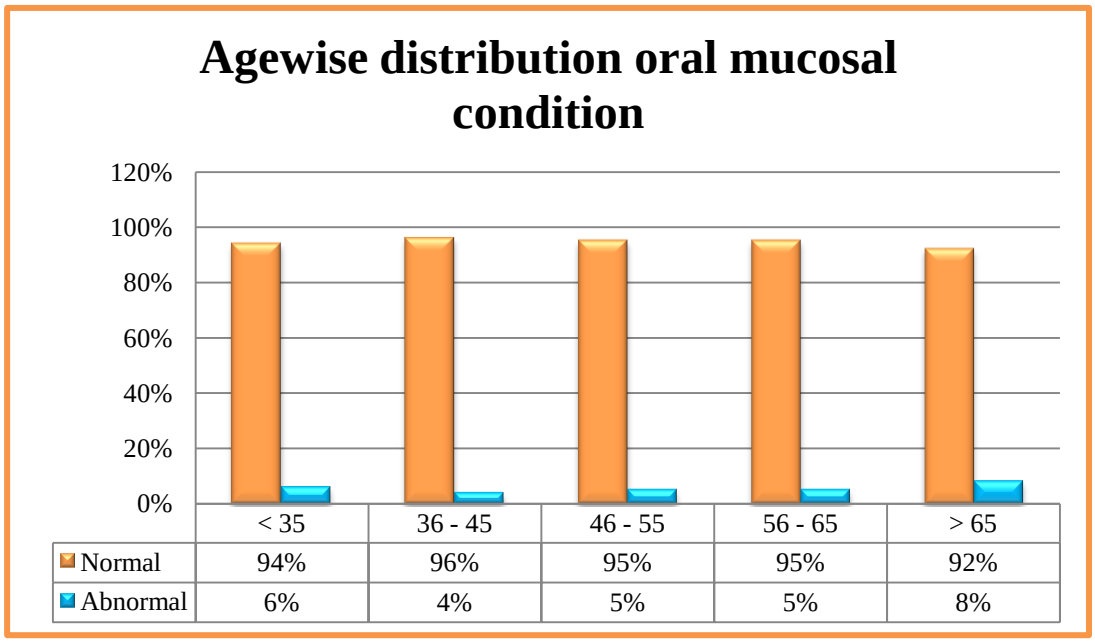


Graph 2: Distribution of Gender according to age group among the study population

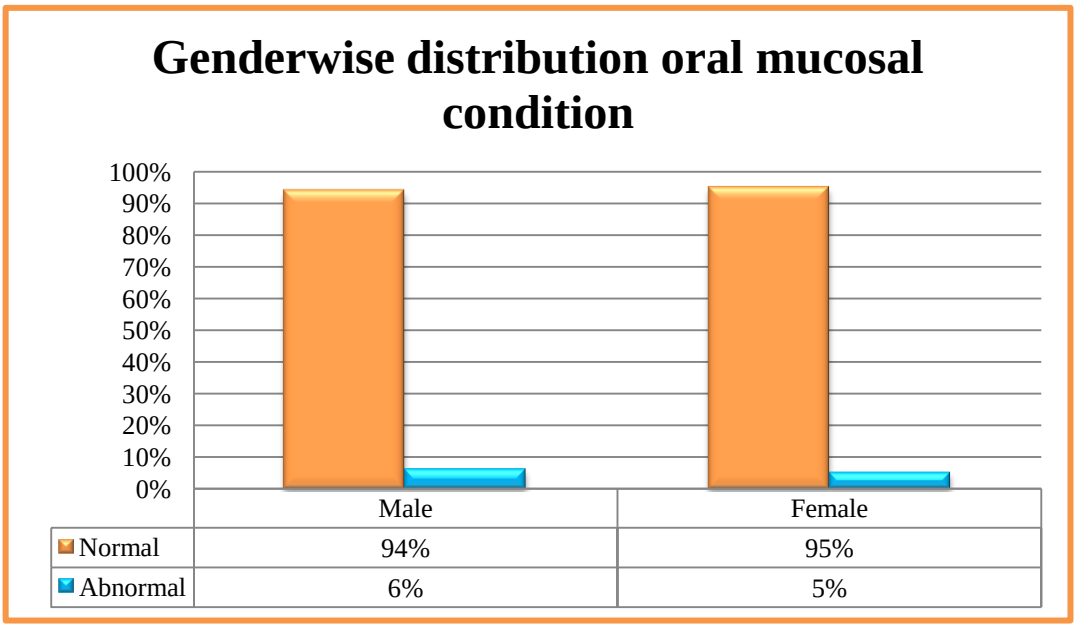


	< 35	36 - 45	46 - 55	56 - 65	> 65
MALE	14%	12%	28%	37%	9%
FEMALE	74%	11%	7%	7%	1%

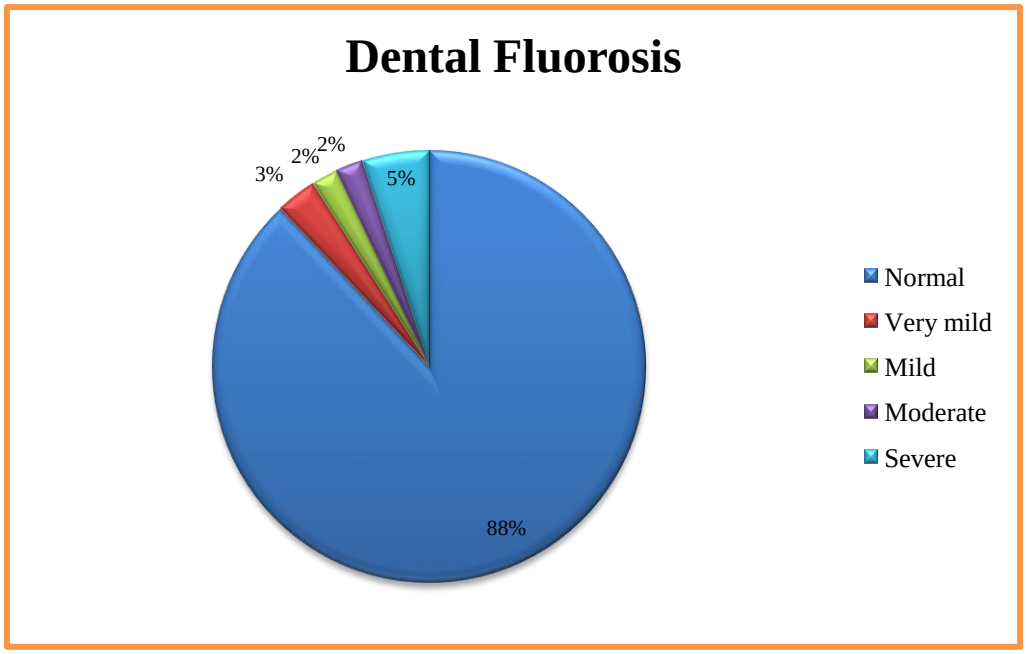
Graph 3: Distribution of Oral mucosal condition among study population based on age group



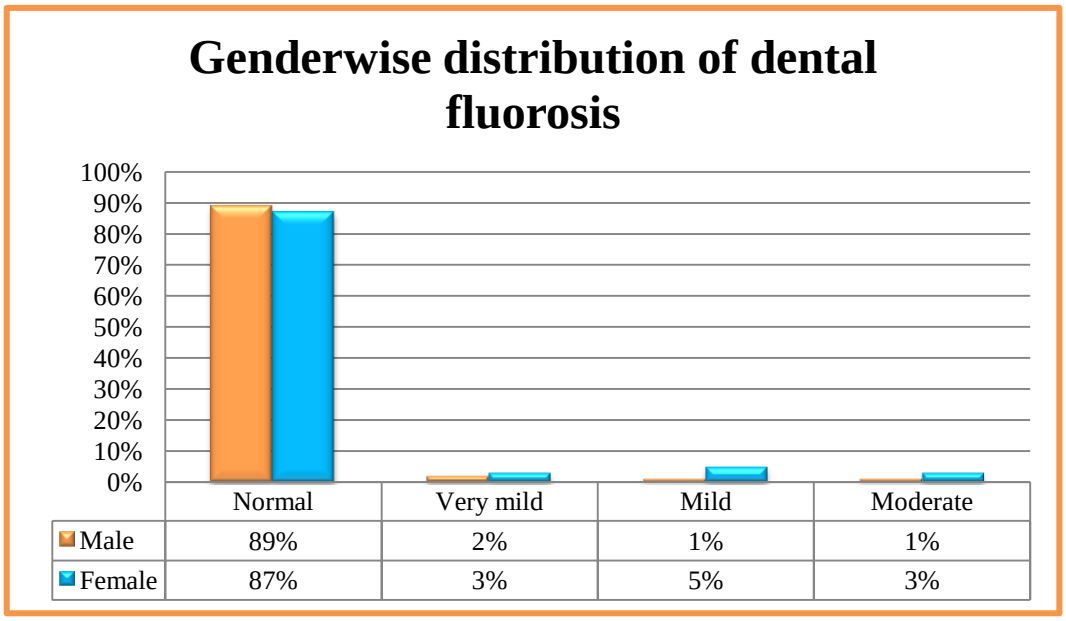
Graph 4: Distribution of Oral mucosal condition among study population based on gender



Graph 5: Distribution of study population based on dental fluorosis

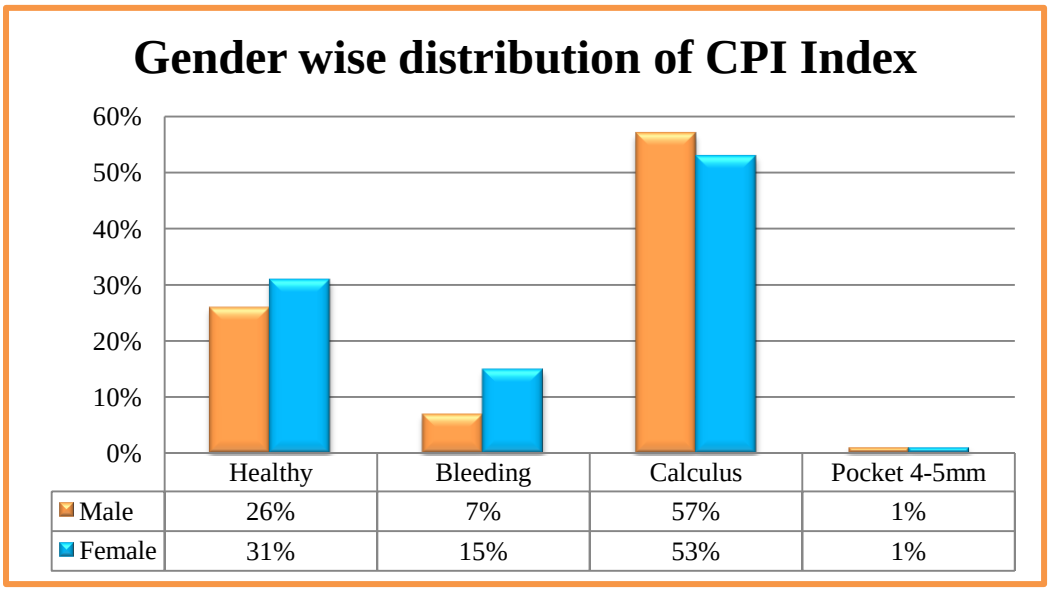


Graph 6: Distribution of dental fluorosis among study population based on gender

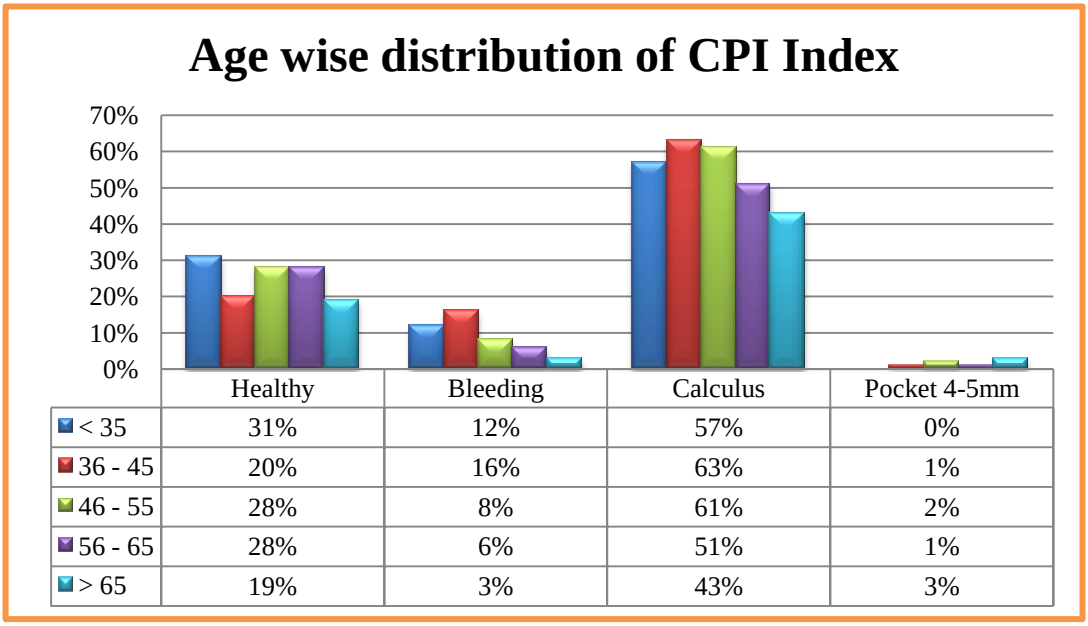


	Normal	Very mild	Mild	Moderate
Male	89%	2%	1%	1%
Female	87%	3%	5%	3%

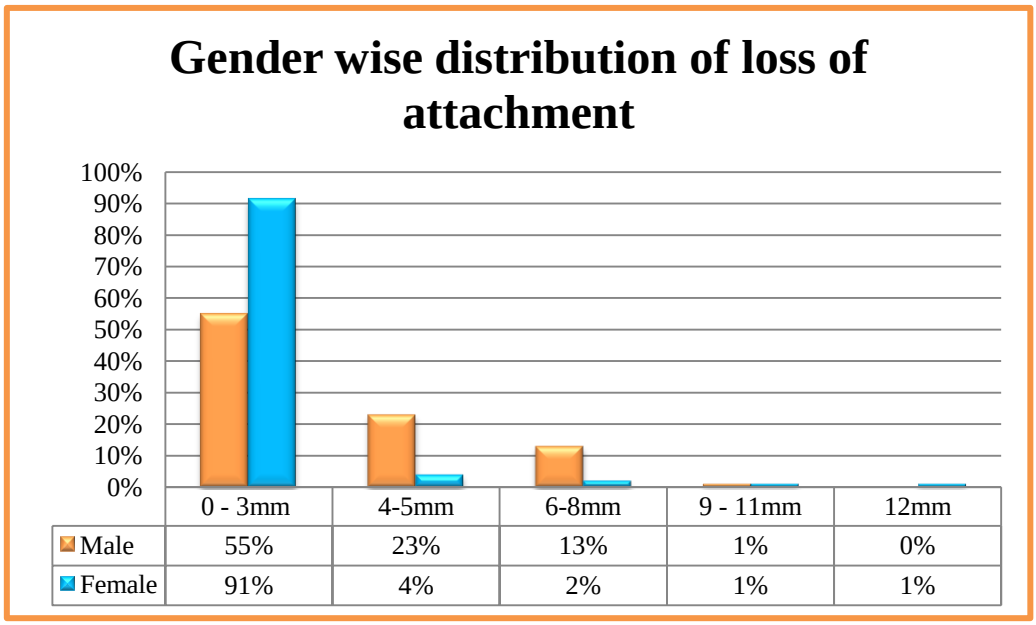
Graph 7: Distribution of periodontal status among study population based on gender



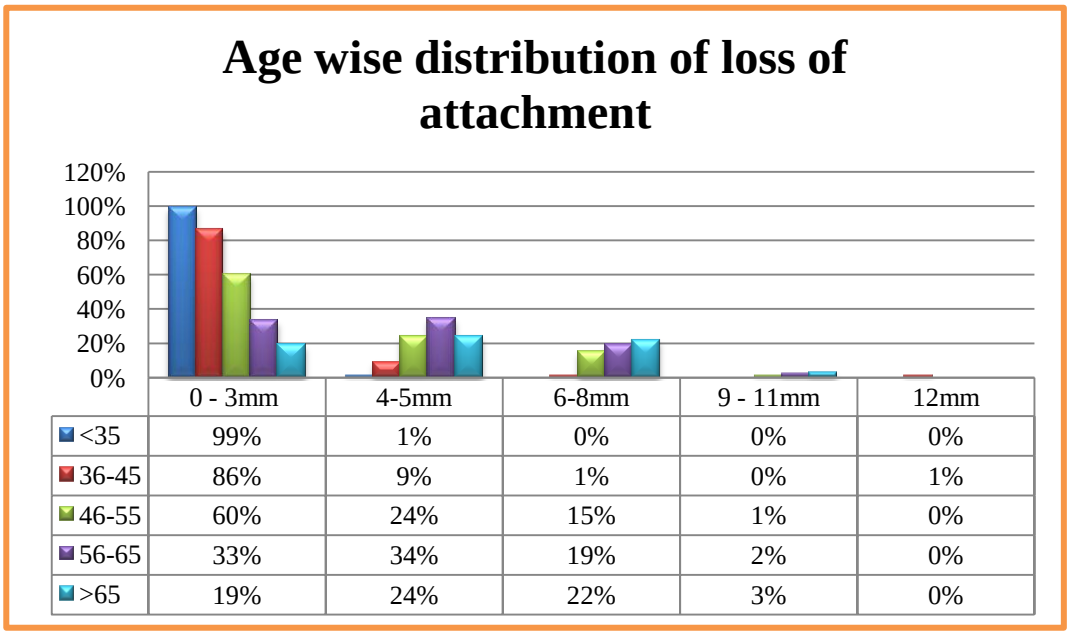
Graph 8: Distribution of periodontal status among study population based on age group



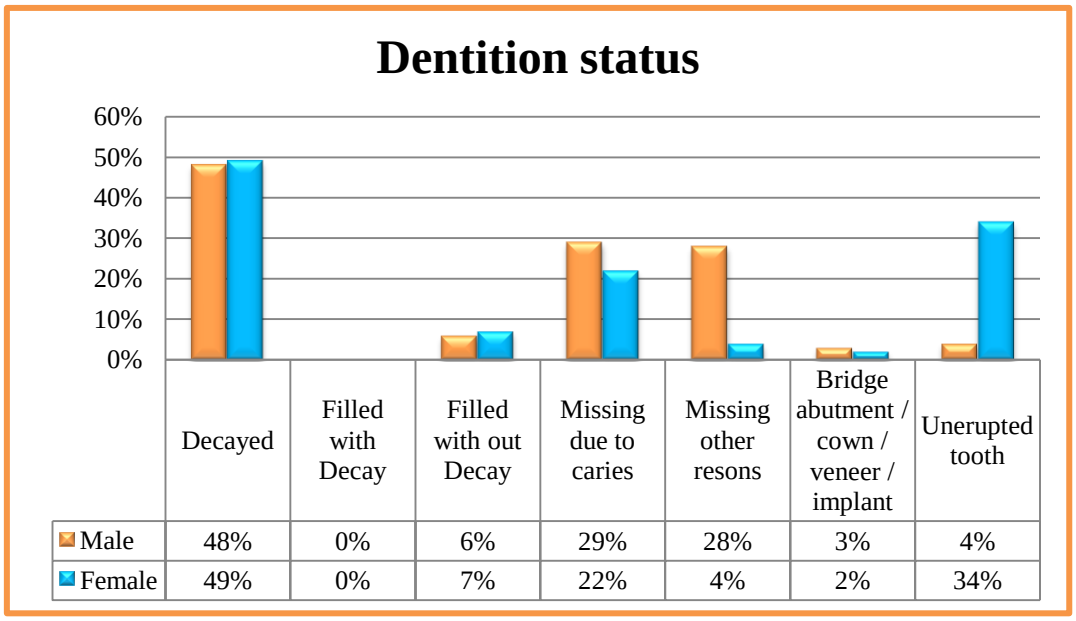
Graph 9: Distribution of loss of attachment among study population based on gender



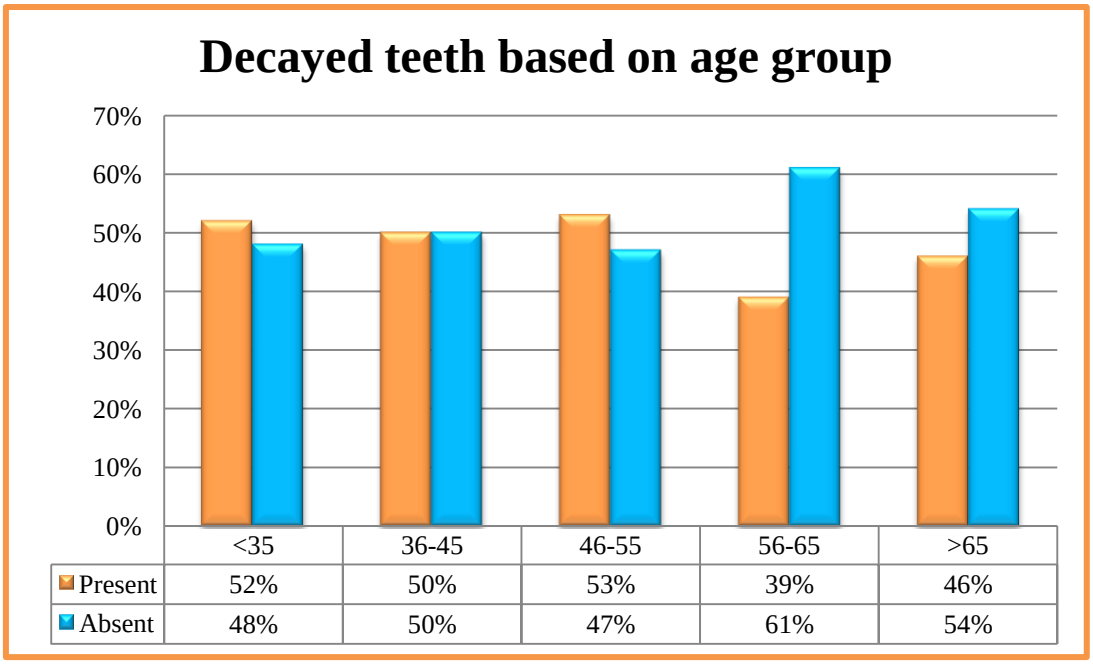
Graph 10: Distribution of loss of attachment among study population based on age group



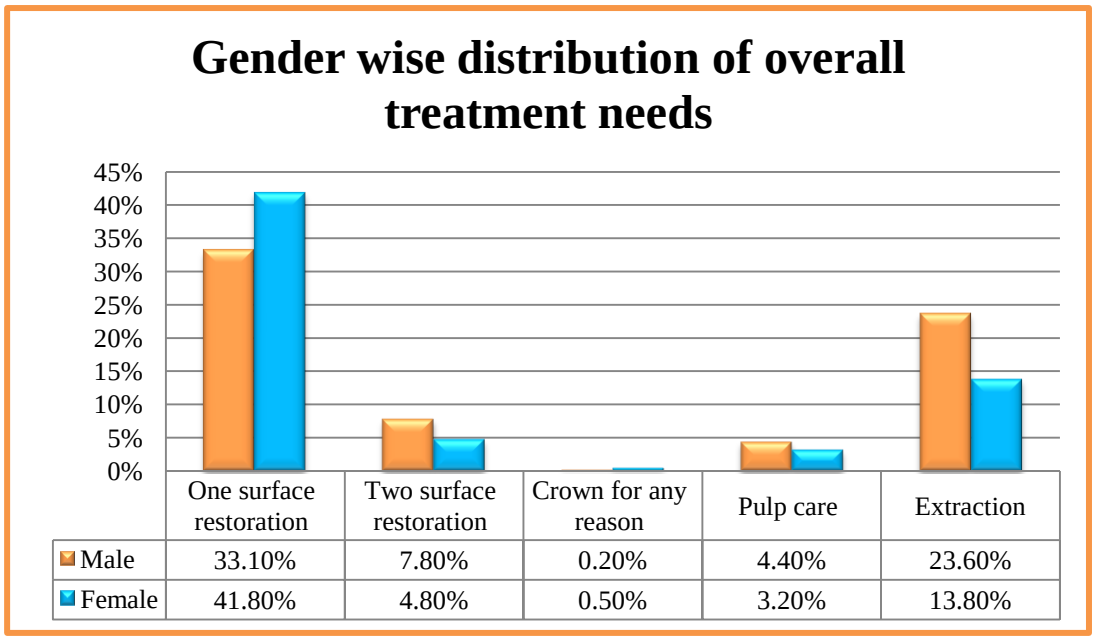
Graph 11: Distribution of dentition status among study population based on gender



Graph 12: Distribution of decayed teeth among study population based on age

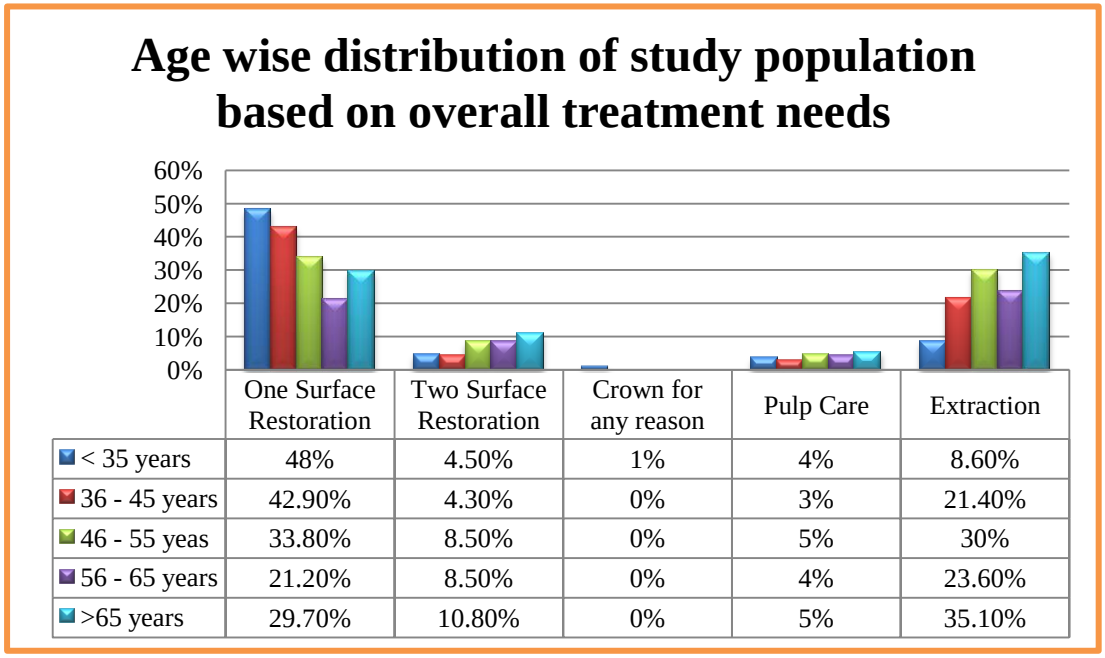


Graph 13: Distribution of mean overall treatment needs among study population based on gender



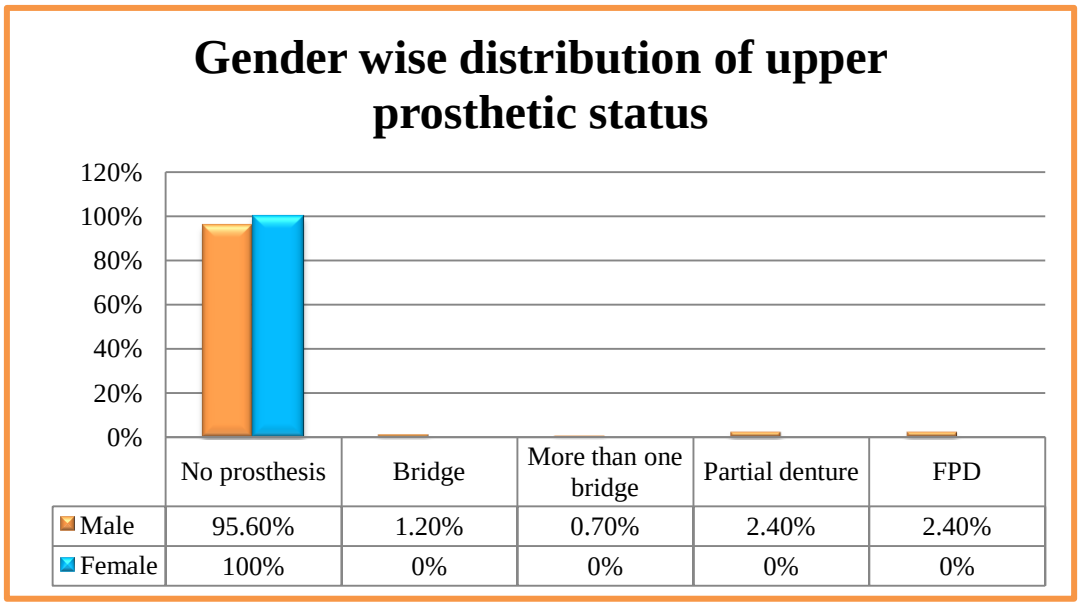
	One surface restoration	Two surface restoration	Crown for any reason	Pulp care	Extraction
Male	33.10%	7.80%	0.20%	4.40%	23.60%
Female	41.80%	4.80%	0.50%	3.20%	13.80%

Graph 14: Distribution of mean overall treatment needs among study population based on age group



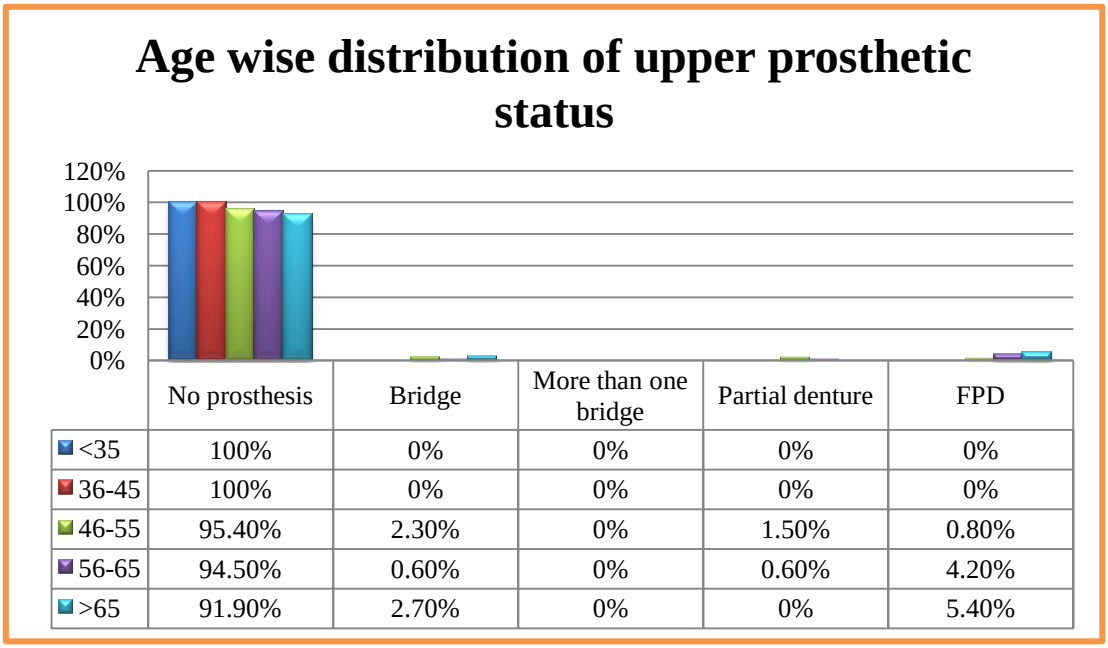
	One Surface Restoration	Two Surface Restoration	Crown for any reason	Pulp Care	Extraction
< 35 years	48%	4.50%	1%	4%	8.60%
36 - 45 years	42.90%	4.30%	0%	3%	21.40%
46 - 55 yeas	33.80%	8.50%	0%	5%	30%
56 - 65 years	21.20%	8.50%	0%	4%	23.60%
>65 years	29.70%	10.80%	0%	5%	35.10%

Graph 15: Distribution of prosthetic status in upper arch among study population based on gender



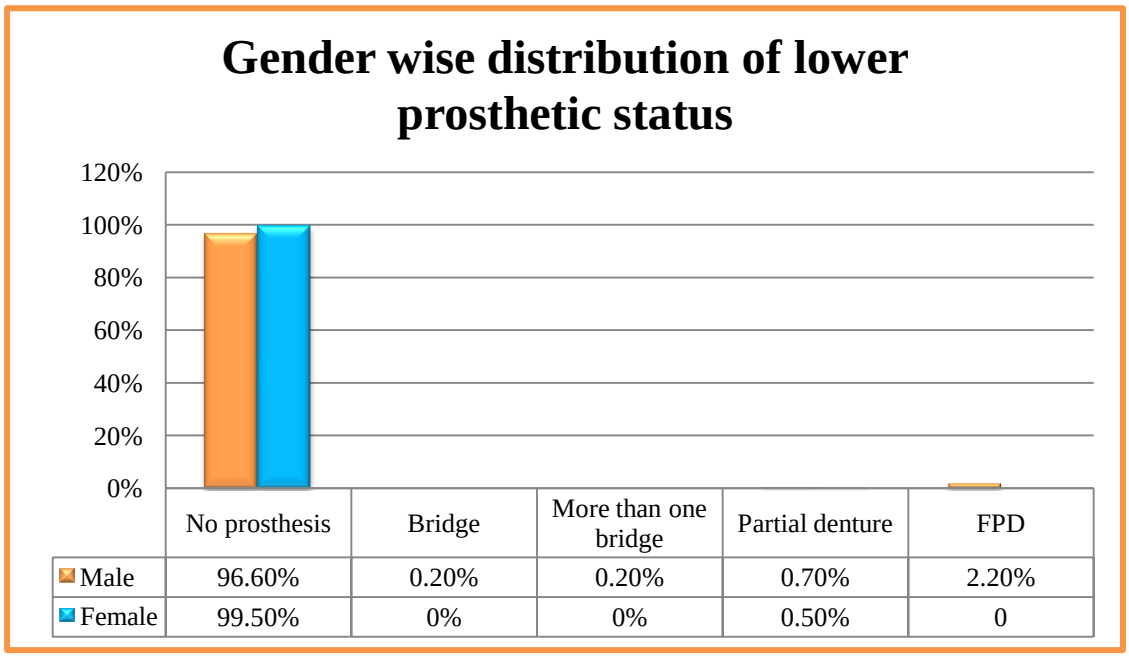
	No prosthesis	Bridge	More than one bridge	Partial denture	FPD
Male	95.60%	1.20%	0.70%	2.40%	2.40%
Female	100%	0%	0%	0%	0%

Graph 16: Distribution of prosthetic status in upper arch among study population based on age group



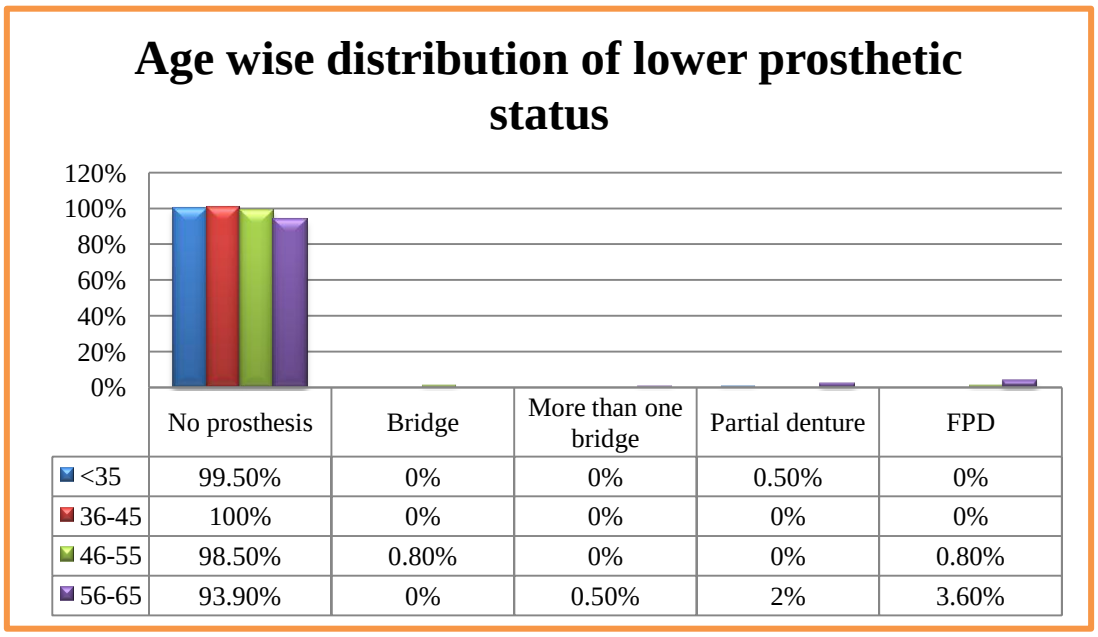
	No prosthesis	Bridge	More than one bridge	Partial denture	FPD
<35	100%	0%	0%	0%	0%
36-45	100%	0%	0%	0%	0%
46-55	95.40%	2.30%	0%	1.50%	0.80%
56-65	94.50%	0.60%	0%	0.60%	4.20%
>65	91.90%	2.70%	0%	0%	5.40%

Graph 17: Distribution of prosthetic status in lower arch among study population based on gender



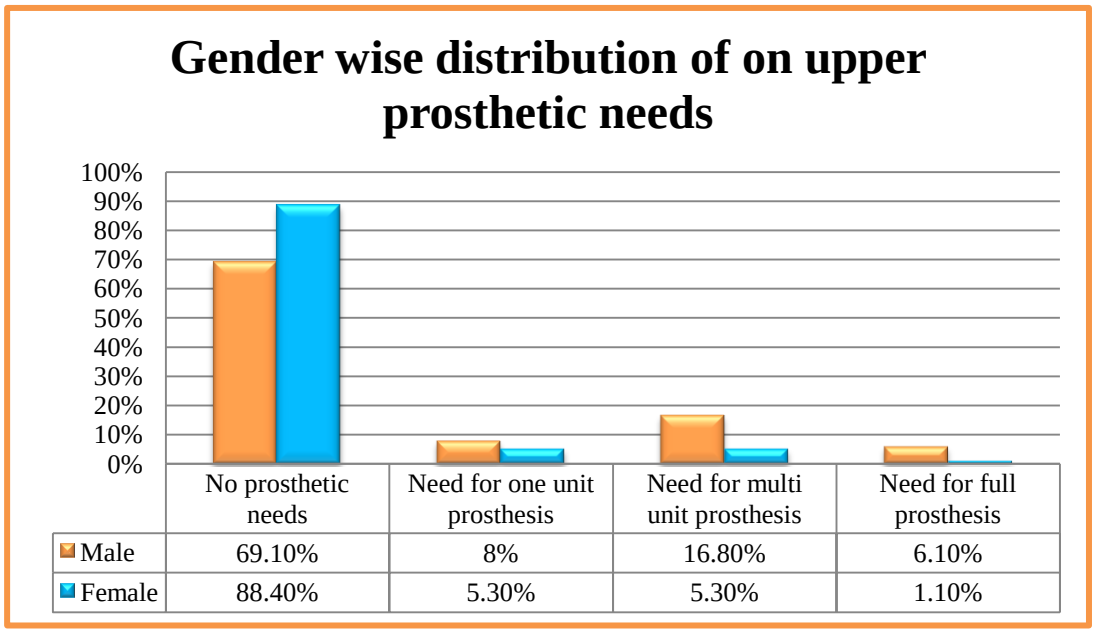
	No prosthesis	Bridge	More than one bridge	Partial denture	FPD
Male	96.60%	0.20%	0.20%	0.70%	2.20%
Female	99.50%	0%	0%	0.50%	0

Graph 18: Distribution of prosthetic status in lower arch among study population based on age group



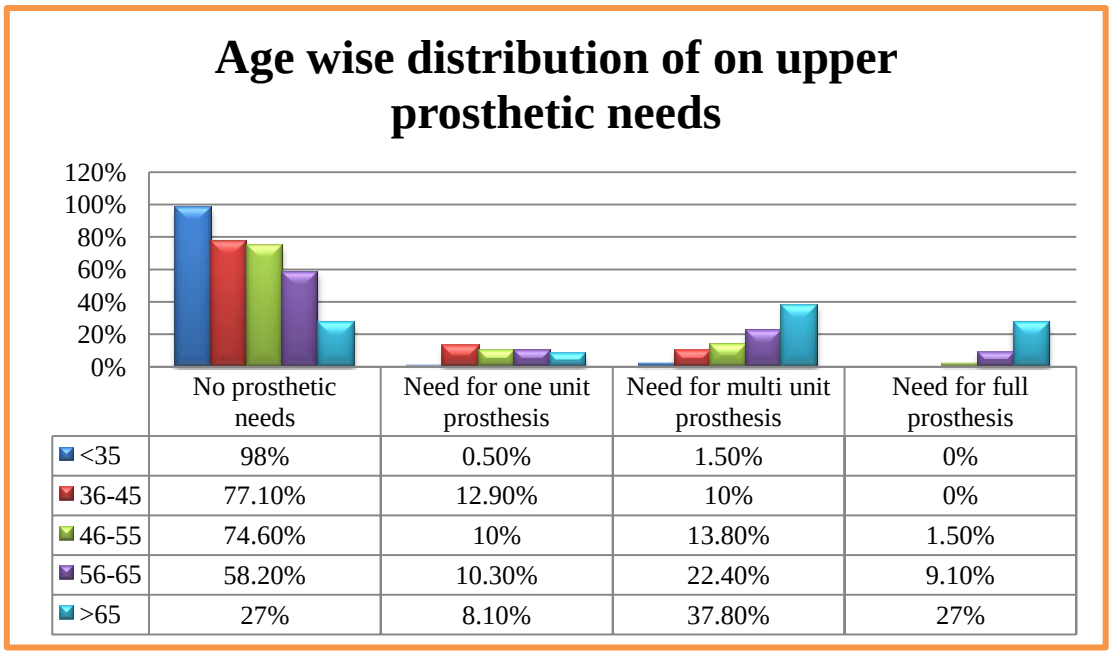
	No prosthesis	Bridge	More than one bridge	Partial denture	FPD
<35	99.50%	0%	0%	0.50%	0%
36-45	100%	0%	0%	0%	0%
46-55	98.50%	0.80%	0%	0%	0.80%
56-65	93.90%	0%	0.50%	2%	3.60%

Graph 19: Distribution of prosthetic needs in upper arch among study population based on gender



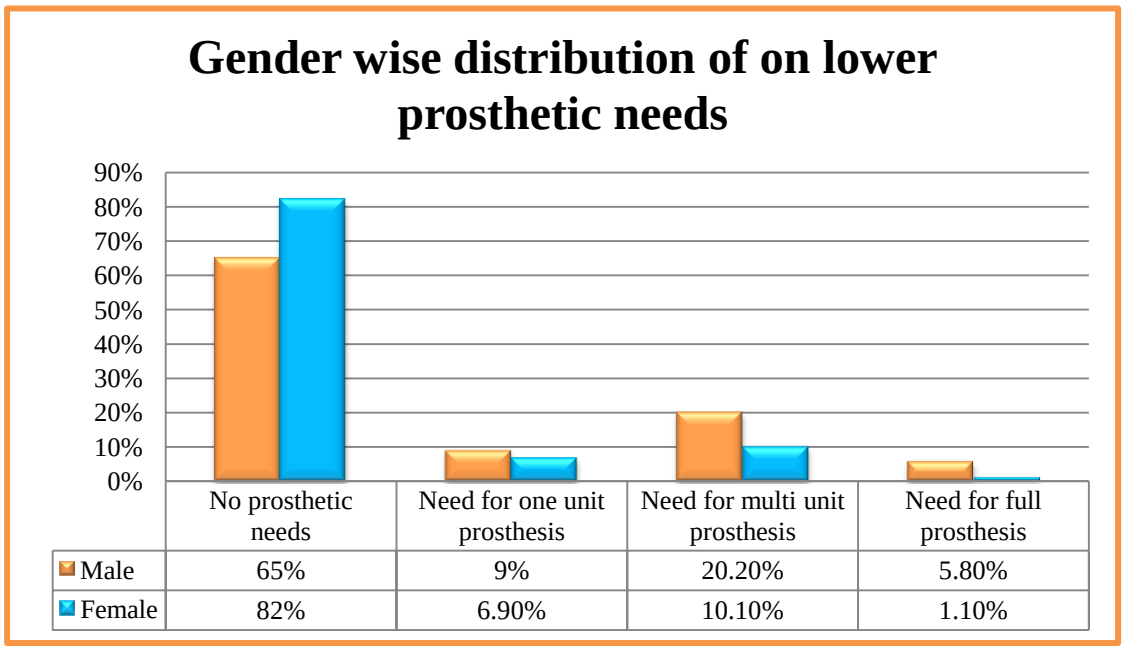
	No prosthetic needs	Need for one unit prosthesis	Need for multi unit prosthesis	Need for full prosthesis
Male	69.10%	8%	16.80%	6.10%
Female	88.40%	5.30%	5.30%	1.10%

Graph 20: Distribution of prosthetic needs in upper arch among study population based on age group

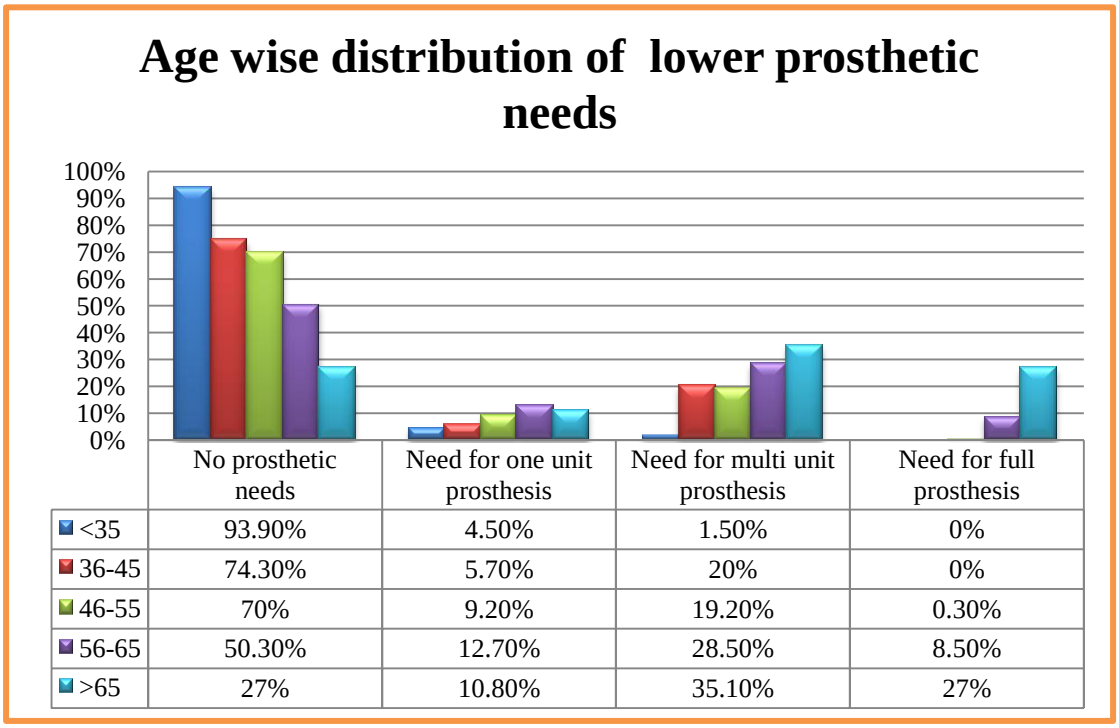


	No prosthetic needs	Need for one unit prosthesis	Need for multi unit prosthesis	Need for full prosthesis
<35	98%	0.50%	1.50%	0%
36-45	77.10%	12.90%	10%	0%
46-55	74.60%	10%	13.80%	1.50%
56-65	58.20%	10.30%	22.40%	9.10%
>65	27%	8.10%	37.80%	27%

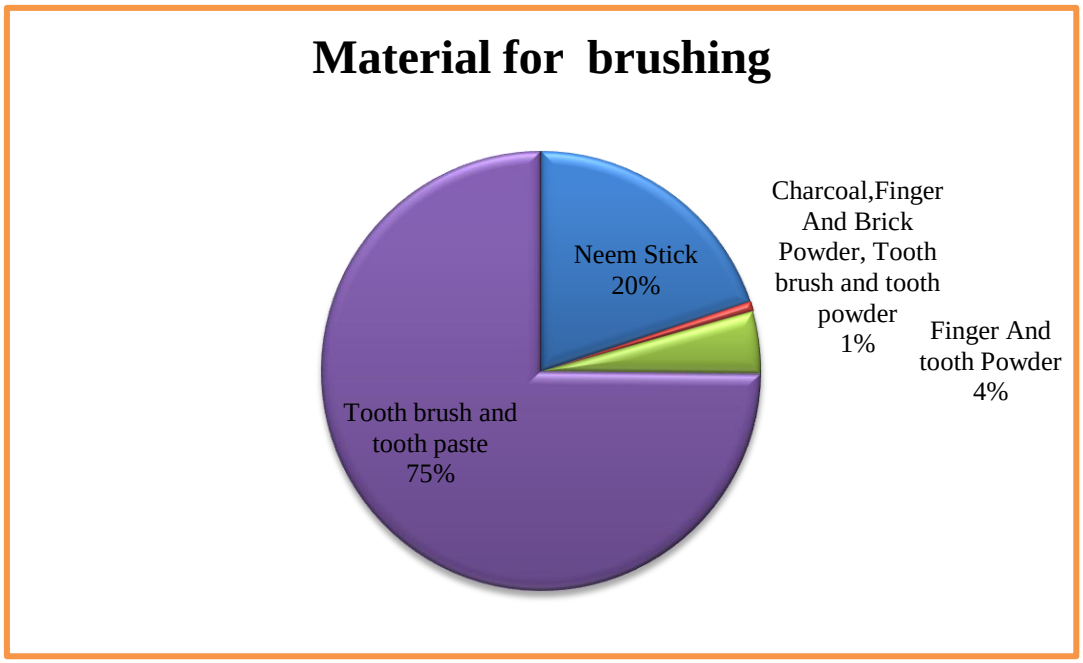
Graph 21: Distribution of prosthetic needs in lower arch among study population based on gender



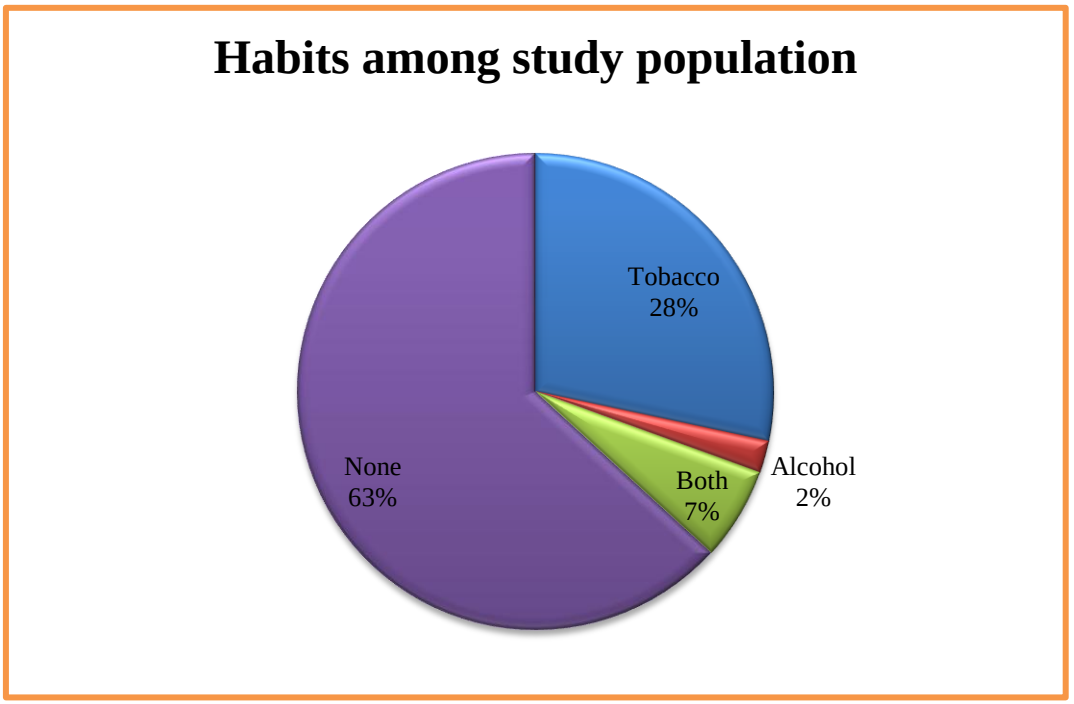
Graph 22: Distribution of prosthetic needs in lower arch among study population based on age group



Graph 23: Distribution of the study population based on oral hygiene materials



Graph 24: Distribution of tobacco and alcohol consumption habits among study population



DISCUSSION

This study highlights the economically active adult population's oral health data, aged from 18-70 years, which is an extended age range and which requires wider investigation. There are few studies about oral health in the working population and the impact of oral disease is well established on the quality of life and daily activities, like work and study.[14]

The intention of the study was to provide systematic information on the oral health of the working population. Health promotion among these workers requires coordinated action by all concerned including the dental profession, institutional authorities, social and economic sectors, and voluntary organizations. Institutional authorities should establish regular oral health care services to provide necessary health education, preventive and curative dental care services.

The comparison of the oral health status of present study among elementary workers is done with other workers like factory, industrial workers, building construction, farm workers and general adult population as no previous comparable data is available.

The present study was conducted among 600 elementary workers in an educational institution. In this study the WHO Oral Health Assessment form (WHO Oral Health Survey - Basic Methods 1997) [24] was used to assess the oral health status and treatment needs of the study population. It is a standardized and most valid measure of oral examination. It can also be used to compare with that of any other groups. Along with WHO Assessment form 1997 a valid pretested closed ended questionnaire was used to assess socio-demographic details, work related information, oral hygiene practice, oral health related behaviors and habits among the elementary workers. The oral health status was assessed by a single examiner to avoid any inter

examiner bias. The oral examinations were conducted in their own working premises, in order to make every worker feasible to participate in the study.

SOCIO DEMOGRAPHIC FACTORS:

Age:

The age of the study population ranged from 18 - 70 years. The mean age of the study population is 40.47± 12.83 years. This finding is similar to the study conducted by **Manchanda K (2013)**[15] in which subjects mean age was 41.91± 12.94.

Educational status:

In the present study, majority of the study subjects were illiterates [107(18%)] and have not completed primary education[87(14%)]. This might be due to the fact that, most of the subject were from rural areas where awareness and access to education were very minimal. Findings similar to the study done by **Sakthi et al (2011),**[25]in which among 321 study participants, 105(32.7%) were illiterate, 131(41%) had education up to fifth standard, 53(16.5%) had education up to seventh standard, 25(7.8%) had completed their tenth standard, 7.7(2.1%) were intermediates.

ORAL MUCOSAL CONDITION:

In the present study about 32(11%) of the study population had oral mucosal lesions. Majority[20(3.3%)] of the study population of them had ulceration of the oral mucosa. This may be due to their stressful working condition and poor dietary habits. Similar finding are found in the study done by **Manchanda K et al (2013)**[15]among the apple farm workers about 794 (88.2%) subjects had healthy oral mucosa; subjects with leukoplakia were found to be 80(8.8%), ulceration 15(1.6%) and 11(1.2%) other condition. The study conducted by **Bansal M(2013)**,[13] among 1384 employees in 38 factories also reported that the prevalence of oro-mucosal lesions was found to be 11.4%. The prevalence of oral mucosal lesion of the present study on comparison

with study done by **Malaovalla et al (1976)**[26] was very less while increased prevalence of oral mucosal lesion was reported by **Jahanbani (2003)**[27] among the Iranian textile workers.

DENTAL FLUOROSIS

In the present study, prevalence of dental fluorosis was found to be 12% among which 3% had very mild fluorosis, 2% had mild and moderate fluorosis and 5% had severe fluorosis. Study conducted by **Bhalla M, et al (2015)**[28] among the Police Personnel in Mathura City found that, prevalence of enamel fluorosis among study subjects was 116 (24.4%).

In a study conducted by **Sanadhya S et al (2013)**[16] among the workers of Sambhar Salts Limited at Sambhar Lake, Jaipur, reported that, severe fluorosis was the most prevalent (23.7%) form of dental fluorosis observed among the study subjects and only 5.5% of the participants had questionable fluorosis.

PERIODONTAL DISEASE:

This present study reported the prevalence of periodontal disease of about 72.5% . About 55 (9.1%) of the study participants had bleeding gums, 336 (56 %) workers had calculus, and 5 (0.8 %) workers had pocket 4-5mm. The prevalence of periodontal disease might be due to lack of awareness and proper oral hygiene practices among the workers. **Singh K et al (2015)**[29]in sugar mill workers reported, 4.45% with bleeding gums and 80.17% had calculus similar to the present study.

In a study conducted by **Bansal M (2013)**[13]among 1384 employees in 38 factories reported that Community periodontal index (CPI) score 2 (calculus) was found more in males than females. Males required oral prophylaxis to be done as their treatment need compared with females. The most prevalent treatment need in the

present study was oral prophylaxis which was same as reported by **Roman A, Pop A (1998)**.[30]

On contradiction higher percentages of subjects in our study were free from any signs of periodontal disease than that reported by **Srikandi TW and Clarke NG (1982)**.[31]

LOSS OF ATTACHMENT:

Study reported a prevalence of about 23.7% of study participants with Loss of Attachment ,among which 17.16% subjects had 4-5mm loss of attachment, 0.9% had 6-8 mm loss of attachment while 0.01% had score between >9-12mm.

Study conducted by **Tatiana F (2008)**[32]among metal processing workers in Brazil during 2002 - 2003 showed that 25.3% had periodontal attachment loss. The poor oral hygiene practice, less awareness about oral health are the most significant factors in the development of Loss of Attachment. Study by **Umesh R et al (2016)**[33] among salt workers of Little Rann of Kutch reported that according to the gender wise distribution of LOA, males had higher loss of attachment when compared to female.

Mishra P et al (2016)[34], in his study among handicraft factory workers in Jaipur city stated that according to the age wise distribution of LOA, 46-56 years had more prevalence of LOA similar to this study.

DENTAL CARIES PREVALENCE AND DMFT STATUS:

The present study had a maximum of 3 decayed, 7 missing and 2 filled teeth components. The similar report is found in the study done by **Mishra P et al (2016)**[34] while study done by **Bachanek T et al (2001)**[35] showed the frequency of decayed tooth and average DMFT index to be less.

As age as age increased, there was a significant increase in the DMFT index is simillar to the results of the study done by **Tomita N E et al (2005)**[9]

The mean number of teeth lost per worker showed a significant increasing trend with age in our study and it was same as that reported by **Bansal M(2013)**[13] and **Hayashi N et al (2001)**[36] reported mean number of teeth loss were significantly greater in the age group of 55-63 years which was also same in all the three studies.

Study presented mean number of the missing teeth due to caries was more in older age group, which was same as reported by **Petersen PE and Tanase M (1997)**.[37] **Frencken JE et al (1989)**[38] reported the effect of sugar cane chewing in the development of dental caries in which Sugar cane cutters had significantly higher mean DMT/S scores than sisal plant workers. For all the age groups, untreated dental caries constituted most of the caries experience and is analogous to the condition observed in the study done by **Petersen PE (1996)**[39].The decay experience of the present study population may be due to their stressful continuous working hours along with the poor diet pattern, inappropriate oral hygiene practices and lack of oral health awareness plays an important role among the elementary workers.

OVERALL TREATMENT NEEDS:

The present study indicated that 215(35.8%) required one surface restoration, 41(6.8%) two surface restoration, 2(0.3%) crown for any reason, 24(4%) pulp care, 123(20.5%) extraction and 215(35.6%) other care. This indicates that worker slack of awareness in maintaining oral hygiene, less frequent visit to dentist and high treatment cost. **Duraiswamy P et al (2008)**[40]based on dental caries treatment needs one surface filling was needed for 44% of the 513 individuals examined, while 12% needed two surface filings approximately similar to the present study. Study by **Chinmaya B R et al (2011)**[41]in Chitradurga, exhibited that 35.7% required fillings, 5.2% need crowns and veneers, 6.5% required Pulp care, 16% required extraction and 6.5% required other treatments such as prosthesis and inlays.

PROSTHETIC STATUS AND TREATMENT NEEDS:

In the present study partial denture is the most common prosthesis worn by study subjects. Prosthetic need increase with the increase with age in the maxillary arch among 55- 63 years age group need for a multi unit followed by full prosthesis was found to be highest.

The results is found to be same as study done by **Bansal M (2013)**.[13]Prevalence of edentulousness and presence of removable denture in the jaws was less than that reported by **Helöe LA and Kolberg JE(1974)**[42]among a group of commuting laborers in Norway.

While the study conducted by **Amith K et al (2013)**[43] among two population of Morabad city, India found that only 16.5% needed prostheses in lower and upper arch which is lesser as compared to the present study.

Study done by **Doughan B et al (2000)**[44] exhibited that the study subjects were in greater need of dentures due to low socio economic conditions.

DELETERIOUS HABITS:

Tobacco Habits:

Among the study participants about 208(34.6%) used tobacco product (either smoking or smokeless or both).The result of our study exhibit that there is relatively less prevalence in the usage of tobacco products among the study participants. When compared to the study done by Shingo **FukayoS et al (2001)**[45] among the smelter workers, in which 72.5% of the workers had smoking habit. **Dagli RJ et al (2008)**[46] among the green marble mine workers, in which 40.3% of the workers had smoking habit. The National Oral Health Survey and Fluoride Mapping[47] showed that the prevalence of smoking was 22.8% among 35 to 44 year olds in India which was similar to the elementary workers included in this study.

In the present study the prevalence of tobacco consumption, may be to get relief from insomnia due to long working hours and tedious working condition.

Alcohol Consumption:

In present study, 8.5% elementary worker had habit of alcohol consumption. The findings were less than the study conducted by **Dagli RJ et al (2008)**[46] among green marble mine workers where the prevalence of alcohol consumption was 15.8%.The prevalence of alcoholism may be to get rid of their stress caused during their work.

ORAL HEALTH BEHAVIOUR:

Oral Hygiene Habits:

Our study exhibited that majority 506(84.3%) of the study participants cleaned their teeth once daily, 61(10.2%) cleaned their teeth twice daily, 1(0.2%) more than twice while 4(0.7%) of them cleaned their teeth occasionally.

The study conducted by **Sakthi S et al (2011)**[25] where 76.9% of construction worker cleaned their teeth once daily.

In a survey conducted by **Mohire NC et al (2009)**[48]on patient with oro-dental conditions in South Maharashtra, it was reported that brushing frequency for once a day was 59.99%, twice a day was 19 .99% and never brushed in a day was 19 .98%.

In another study conducted by **Sajith V et al (2008)**[49]on 805 selected adult Indian patients in the age group from 30 to 69 years, results showed that, most of them brushed their teeth once a day (82.4 %), almost similar to the present study. In a study conducted by **Rajkumar et al (2011)**[50] among match factory workers in Gudiyatham, the results showed 82% reported that they brushed their teeth once daily, 5% brushed their teeth twice daily and 13% never brushed their teeth daily.

Materials used for cleaning their teeth:

Majority of our study participants 71.3% used tooth brush and tooth paste while 19% used neem stick to clean their teeth. The reason for this may be due to the fact that, most of them belongs to the rural area.

The study conducted by **Sakthi S et al(2011)**[25] among building construction workers showed that 74.5% of the workers used toothbrush and toothpaste, 5.3% of the workers used finger and tooth powder, 1.5% of the workers used finger and toothpaste and 1.4% of the workers used toothbrush and toothpowder to clean their teeth.

Similarly, in a study conducted by **Sajith V et al (2008)**[49], the results showed that, 90.9% of them used toothbrush and toothpaste to clean their teeth.

In a study conducted by **Rajkumar et al (2011)**[50]among match factory workers in Gudiyatham, the results showed 89.6% use toothbrush as their oral cleaning aids and 8.7% use as their oral cleaning aids. Among those who used toothbrush and finger as oral hygiene aids, 94% use toothpaste and 6% use toothpowder as the material for brushing.

Method of Brushing:

In this present study, 48.2% of workers used horizontal strokes for cleaning their teeth, 4% of workers used vertical strokes, 1.8% used circular stroke for cleaning their teeth, while 17.1% used combination of stroke. In contrast to the present results, a study conducted by **Ganss C et al (2011)**[51], on tooth brushing habits in uninstructed adults, the results showed that, only 8.7% used horizontal motion. 73.8% brushed with circular motion, 13.6% with horizontal and circular motion and 3.9% with vertical motion. This difference in present study may be due to the lack of knowledge about the appropriate brushing techniques to be used.

SUMMARY

The present descriptive cross-sectional study was conducted to assess the oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode, Tamil Nadu. Ethical clearance was obtained from the Institution Review Board of Vivekanandha Dental College for Women, permission was obtained from concerned authority of the educational institution, Tiruchengode, to conduct the study. Informed consent was obtained from elementary workers before obtaining data and oral examination.

Elementary workers who were present on the day of examination were included. Workers who were not willing to give informed consent were excluded. Data was collected using Performa which consisted of WHO basic oral health assessment form (1997). The collected data was subjected to statistical analysis using SPSS 20 version (IBM, United States of America).

The findings of the current study were as follows:

- Of the 600 elementary workers were examined, majority 411(68%) workers were males and 189(32%) were females.

- About 23(6%) of males and 9(5%) of females had abnormalities in their oral mucosa.

- About 32(5%) had severe fluorosis, 15(3%) workers had very mild dental fluorosis, 14(2%) had mild fluorosis and 9(2%) had moderate dental fluorosis.

- The present study showed 165 (27.5%) workers had healthy gingiva, 55(0.09%) had bleeding gums and 336 (56%) workers had calculus.

- Subjects of 103 (17.1 %) had 4-5mm and 59 (9.8 %) had 9-11 mm of loss of attachment.

- Totally 289 (48%) workers had decayed crown, 160 (27%) had teeth missing due to caries, 40(7%) had filled crown, 16(3%) had abutment, 125 (21%) had teeth missing due to other reason.

- The mean decayed, missing and filled teeth (DMFT) was 3.58 ± 4.73.

- Among the workers, 215 (35.8%) required one surface restoration, 41 (6.8%) required two surface restoration, 24 (4%) required pulp care and 123 (20.5%) required extraction.

- Totally 451 (75.1%) do not need any prosthesis.

- About 170(28.3%) had habit of tobacco consumption, 13(2.2%) had habit of alcohol consumption and 38(6.3%) of elementary workers had habit of both tobacco and alcohol consumption.

- About 428 (71.3%) of the workers used tooth brush and tooth paste for maintaining oral hygiene while nearly 114 (19%) of workers were using neem stick for cleaning their teeth.

CONCLUSION

World Health Organization established the goal for the global oral health the minimization of the impact of oral diseases on health and psychosocial development by the year 2020, in order to reduce the absenteeism from work. Oral health promotion by early diagnosis and control of diseases is one of the tools to reach this target, which will reflect in the reduction of tooth losses. Epidemiological survey helps to identify health related events and also useful in generating the etiological hypothesis and subsequently provides base for future research.

Despite various steps taken to improve the oral health of people, oral health problems still remain as a burden in many developing countries particularly among worker's group. In face of the results obtained, this study shown that elementary workers in the community do suffer from various oral health problems such as dental caries with a mean DMFT of 3.58 ± 4.73 and about 57% of them had periodontal problems. This study also highlighted the contribution attributed to oral health services, lack of awareness and utilization of dental services.

Primary oral healthcare programs like dental screening and oral health education at regular intervals should be made mandatory which will help to prevent accumulation of healthcare demands of the workers. It plays a key role in national development. The elementary workers who form the life line of any developing country are usually confined only to their work environment. However, many a times they are not given due importance. Hence, continuous professional research and development is essential to improve overall health and development of such population, so as to have a healthy productive labor population for development of any nation.

RECOMMENDATION

1. Providing access to care for this population should be a priority.
2. Steps should be taken to promote the oral health status of those workers in order to motivate them to maintain their oral hygiene.
3. Advertisements showing the appropriate hygiene aids and practices including the correct brushing technique should be disseminated through various media like the magazines, bulletin boards and during dental camps and festivals.
4. To organize intervention for the tobacco consumption habit by creating awareness about the harmful effects of tobacco. To start tobacco cessation clinics to aid the workers in cessation of the tobacco consumption by tobacco counseling.
5. Set up a group insurance scheme so that the workers can avail dental treatment at a reasonable cost.

A planned, coordinated, interdisciplinary approach involving a team of specialists between medical and dental, and social care sectors is necessary to create oral health awareness, to develop oral health policies, to provide basic oral health services, and to reduce the disease burden on this underprivileged population. Hence, appropriate public health actions at various levels need to be taken like health education and health promotion is of utmost important to curtail the disease in this population.

REFERENCES

1. Ustun AP, Corvalan C. Preventing Disease Through Healthy Environments. Publication of World Health Organisation, 2006. WHO press. pg 21.
2. Marcenes W, Kasseabaum NJ, Barnabé E, Flaxman A, Naghavi M, Lopez A, et al. Global Burden of oral conditions in 1990- 2010: a systematic analysis. J Dent Res. 2013;92(7):592-7.
3. International Standard Classification of Occupations: ISCO -08 / International Labour Office - Geneva: ILO, 2012.
4. Peterson PE. Dental visits, dental health status and need for dental treatment in a Danish industrial population. Scand J Soc Med 1983; 11(2): 59-64.
5. Masalin K, Murtomaa H,Meurman JH. Oral health of workers in the modern Finnish confectionery industry. Community Dent Oral Epidemiol 1990; 18:126-30.
6. Ahlberg J, Tuominen R, Murtomaa H. Dental knowledge, attitudes towards oral health care and utilization of dental services among male industrial workers with or without an employer provided dental benefit scheme. Community Dent Oral Epidemiol 1996; 24: 380 – 4.
7. Amin WM, AL-Omoush SA,Hattab FN. Oral health status of workers exposed to acid fumes in phosphate and battery industries in Jordan. Int Dent J 2001; 51(3):169-174.
8. Bachanek T, Pawlowicz A, Tarczydlo B,Chalas R. Evaluation of Dental Health in mill workers Part-I State of the Dentition. Ann Agric Environ Med 2001; 8(2): 103-5.

9. Tomita NE, Chinellato LEM, Lauris JRP, Kussano CM, Mendes HJ, Cardoso MT. Oral Health Of Building Construction Workers: An Epidemiological Approach. J Appl Oral Sci 2005; 13(1): 24-7.
10. Roy S, Dasgupta A. A study on health status of women engaged in a home based "papad making" industry in a slum area of Kolkatta. Indian J Occup Environ Med2008; 12 (1): 33 – 5.
11. Haldiya.K.R, Sachdev.R, Mathur.M.L. Work related Health problems in Salt Workers of Rajasthan. Indian J Occup Environ Med 2010; 10 (2) : 62 – 4.
12. Sood M, Blaggana A, Vohra P, SarafB.Periodontal Status of Smoker and Non smokerCeramicFactory Workers. J ID2011;1(3):1-6
13. Bansal M, Veeresha KL. Oral health status and treatment needs among factory employees in Baddi-Barotiwala- Nalagarh Industrial hub, Himachal Pradesh, India. Indian J Oral Sci 2013; 4:105-9.
14. BatistaMJ, Rihs LB, Sousa MR. Workers oral health: a cross-sectional study. Braz J Oral Sci 2013; 12(3):178-83.
15. Manchanda K, Naganandini S. Oral Health Status And Treatment Needs Among Apple Farm Workers In Shimla (Rural), Himachal Pradesh. Indian J Dent Sci 2013; 5(4s):005-8.
16. Sanadhya et al.The Oral Health Status and the Treatment Needs of Salt Workers at Sambhar Lake, Jaipur, India. J ClinDiagn Res. 2013; 7(8): 1782-6.
17. Khurana S, Jyothi C, Dileep CL, JayaprakashK.Oral health status of battery factory workers in Kanpur city: A cross-sectional study. J Indian Assoc Public Health Dent 2014; 12:80-7.

18. Sharma A , Thomas S, Dagli RJ, Solanki J, Arora G, Singh A. Oral health status of cement factory workers, Sirohi, Rajasthan, India. JHRR 2014; 1(1):15 - 9.
19. Sherley MM, Nivetha A, Ganesh R. Oral health status of cracker workers in Sivakasi, Tamil Nadu, India - A cross-sectional study. J Indian Assoc Public Health Dent 2015; 13:384-8.
20. Singh M, Ingle NA, Kaur N, Yadav P, Ingle E, Charania Z. Dental Caries Status and Oral Hygiene Practices of Lock Factory Workers in Aligarh City. J Int Oral Health 2015; 7(6):57-60.
21. CavalcantiAF, Fernandes LH, Cardoso AMR, Santos JSJ, Maia EG, Cavalcanti AL. Oral Health Status of Brazilian Workers of a Textile Industry. Pesq Bras OdontopedClinIntegr 2017, 17(1):e3454.
22. Jyothi C, Giriraju A. Oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, Karnataka. IJCMR 2017;4(5):1017-20.
23. Rao BV, Suresh Babu AM, Kamalsha SK, Rao MS, Karthik K. Oral health status and treatment needs of Gunj marketing yard laborers of Raichur City, Karnataka. J Pharm BioallSci 2017; 9:195-200.
24. World Health Organization, Oral heath surveys: basic methods, 4th edition.Geneva: World Health Organization,AITBS Pub; 1997.
25. Sakthi S, John J, Saravanan S, Pradeep R. Periodontal health status and treatment needs among building construction workers in Chennai, India. J Int Oral Health 2011; 3(6):7-13.

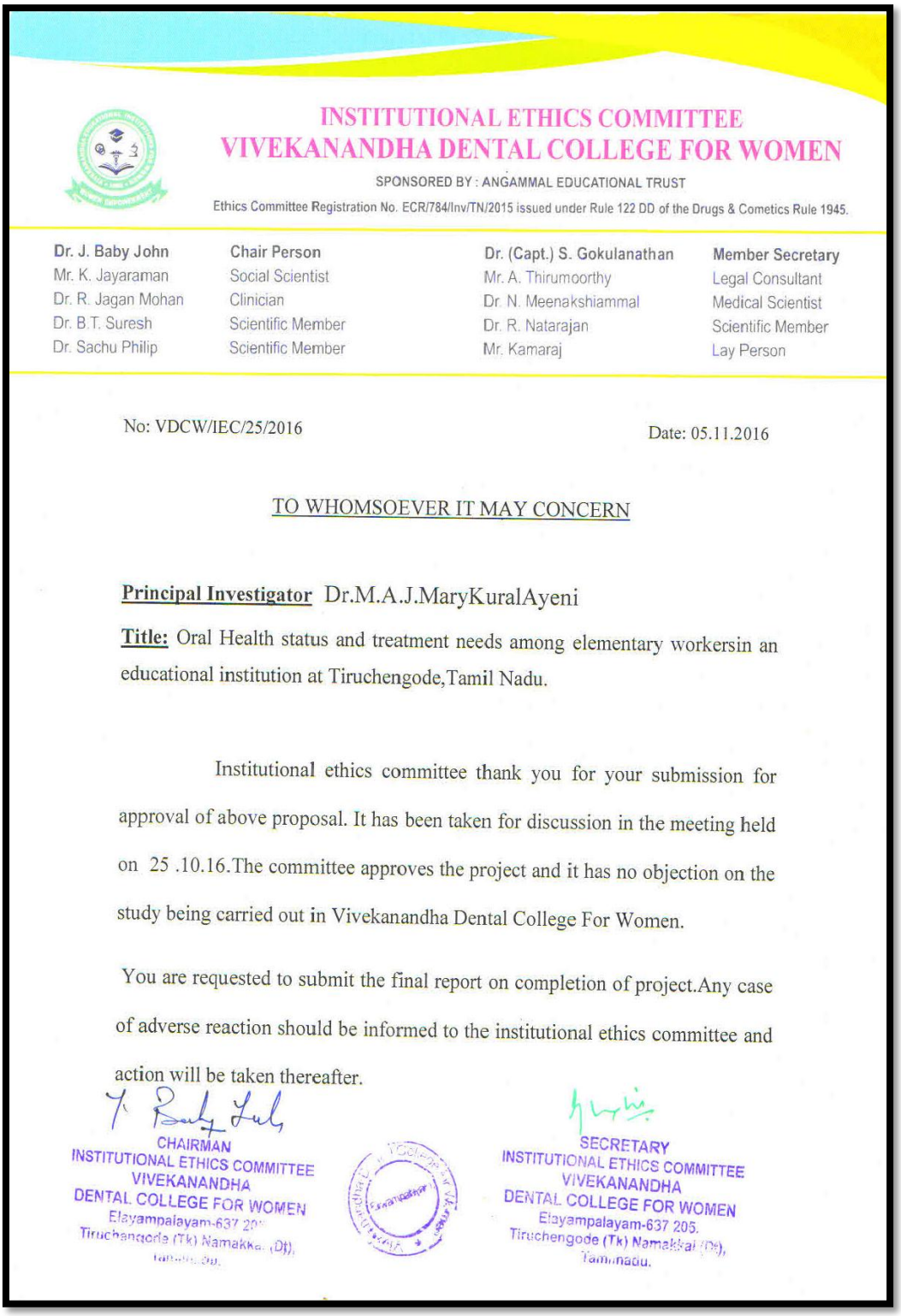
26. Malaovalla AM, Silverman S, Mani NJ, Bilimoria KF, Smith LW. Oral cancer in 57,518 industrial workers of Gujarat, India: A prevalence and followup study. Cancer 1976;37:1882-6
27. Jahanbani J. Prevalence of oral leukoplakia and lichen planus in 1167 Iranian textile workers. Oral Dis 2003; 9:302-4.
28. Bhalla M, Imgle NA, Kaur N, Ingle E, Chandan D and Charani Z. Oral health status and treatment needs of Police Personnel in Mathura City. J Int oral Health. 2015; 7(9): 51- 3.
29. Singh K .Is oral health of the sugar mill workers being compromised?. JCDR 2015; 9 (6):7-10.
30. Roman A, Pop A. Community periodontal index and treatment needs values (CPITN) in a factory worker group in Cluj-Napoca, Romania. Int Dent J 1998; 48:123-5.
31. Srikandi TW, Clarke NG. Periodontal status in a South Australian industrial population. Community Dent Oral Epidemiol 1982; 10:272-5.
32. De Almeida TF, Vianna MIP, Santana VS et al. Occupational exposure to acid mists and periodontal attachment loss Cad. SaúdePública, Rio de Janeiro 2008; 24(3):495-502.
33. Umesh R. Assessment of oral health among salt workers of Little Rann of Kutch, North Gujarat. IJASE2016; 3 (3):431-37.
34. Mishra P. Oral health status and treatment needs among handicraft factory workers in Jaipur city, Rajasthan. Int J PrevClin Dent Res. 2016; 3 (2): 92-7.
35. Bachanek T, Pawlowicz A, Tarczydlo B, Chalas R. Evalution of the dental health in mill workers. Part I. The state of dentition. Ann Agric Environ Med 2001; 8(1): 103- 5.

36. Hayashi N, Tamagawa H, Tanakai M, Haniokai T, Maruyama N, Takeshita T, et al. Association of tooth loss with psychosocial factors in male Japanese employees. J Occup Health 2001; 43:351-5.
37. Petersen PE, Tanase M. Oral health status of an industrial population in Romania. Int Dent 1997; 47(4):194- 8.
38. Frencken JE, Rugarabamu P, Mulder J. The Effect of Sugar Cane Chewing on the Development of Dental Caries. IntAsso Dent Research.1989; 68(6):1102-04.
39. Petersen PE, Razanamihaja N. Oral health status of children and adults in Madagascar.Int Dent J 1996 Feb; 46(1):41- 7.
40. Duraiswamy P, Kumar TS, Dagli RJ, Chandrakant, Kulkarni S. Dental caries experience and treatment needs of green marble mine laborers in Udaipur district, Rajasthan, India. Indian J Dent Res.2008; 19(4):331- 4.
41. Chinmaya B R, ShaikHyderali K H, Srivastava B K, Pushpanjali K. Oral health status and treatment needs in Chitradurga, India and strategies to meet the needs. AOSR. 2011; 1(1):14-25.
42. Helöe LA, Kolberg JE.Dental status and treatment pattern in a group of commuting laborers in Norway. Community Dent Oral Epidemiol 1974; 2:203-7.
43. Amith K. Assessment of dental caries status, periodontal health and oral hygiene practices among two populations of Morabad City, India. IJOSH2013;3 (2): 22- 6.
44. Doughan B, Kassak K and Bourgois DM. Oral health status and treatment needs of 35-44 years old adults in Lebanon. Int Dent J. 2000; 50(6):395- 9.
45. Fulkyo S, Nonaka K Yano E. Differential caries patterns among smelter workers with Dental Erosion. J Occup Health 2001; 43:265- 70.

46. Dagli RJ, Kumar S, Dhanni C, Duraiswamy P and Kulkarni S. Dental health among green marble mine laborers, India. J Oral Health Comm Dent. 2008; 2(1):1-7.
47. Bali RK, Nandakumar K, Ravindran V. National oral health survey and fluoride mapping 2002 -03. New Delhi, India; Dental Council of India, 2004.
48. Mohire NC, Yadav AV, Gaikwad VK. Current Status of Oral Hygiene: A Clinical Survey Report. Research J. Pharm. and Tech. 2009: 2(2):274- 82.
49. Sajith V, Jacob V, Smejkalova1 J et al. Tobacco habits and oral health status in selected Indian population. Cent Eur J Public Health 2008;16(2):77–84
50. Rajkumar M, Ingle NA, Chaly EP, Reddy VC. Oral Health Status and Treatment Needs of Match-box Factory Workers in GudiyathamTaluk, Vellore District. JIAPHD 2011;18(1):525-48
51. Ganss C, Schlueter N, Preiss S et al. Tooth brushing habits in uninstructed adults frequency, technique, duration and force. Clinical Oral Investigations 2011; 13(2):203- 8.

ANNEXURE- I

INSTITUTIONAL REVIEW BOARD APPROVAL



INSTITUTIONAL ETHICS COMMITTEE
VIVEKANANDHA DENTAL COLLEGE FOR WOMEN
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST
Ethics Committee Registration No. ECR/784/Inv/TN/2015 issued under Rule 122 DD of the Drugs & Cometics Rule 1945.

Dr. J. Baby John	Chair Person	Dr. (Capt.) S. Gokulanathan	Member Secretary
Mr. K. Jayaraman	Social Scientist	Mr. A. Thirumoorthy	Legal Consultant
Dr. R. Jagan Mohan	Clinician	Dr. N. Meenakshiammal	Medical Scientist
Dr. B.T. Suresh	Scientific Member	Dr. R. Natarajan	Scientific Member
Dr. Sachu Philip	Scientific Member	Mr. Kamaraj	Lay Person

No: VDCW/IEC/25/2016 Date: 05.11.2016

TO WHOMSOEVER IT MAY CONCERN

Principal Investigator Dr.M.A.J.MaryKuralAyeni

Title: Oral Health status and treatment needs among elementary workersin an educational institution at Tiruchengode,Tamil Nadu.

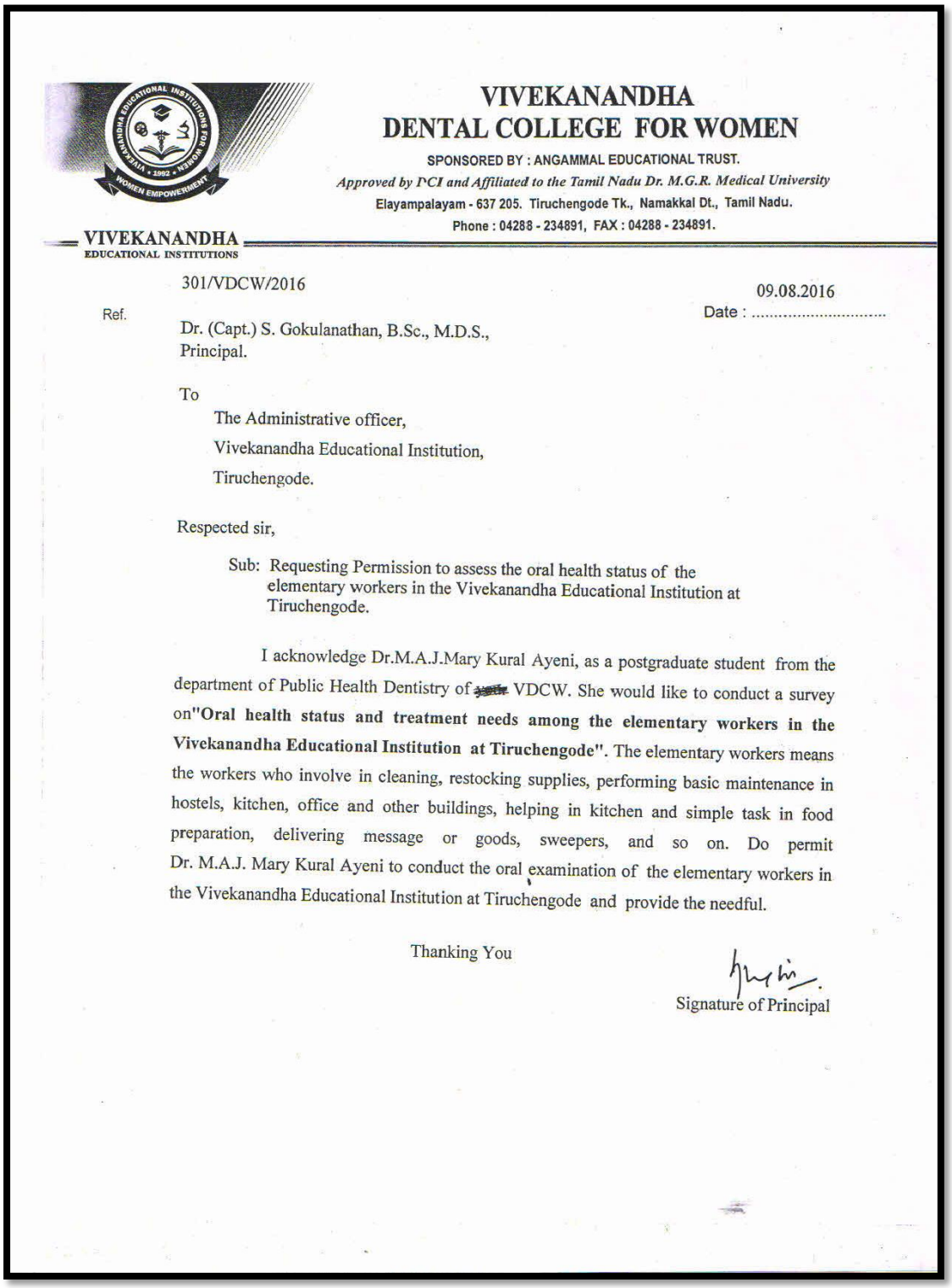
Institutional ethics committee thank you for your submission for approval of above proposal. It has been taken for discussion in the meeting held on 25 .10.16.The committee approves the project and it has no objection on the study being carried out in Vivekanandha Dental College For Women.

You are requested to submit the final report on completion of project.Any case of adverse reaction should be informed to the institutional ethics committee and action will be taken thereafter.

CHAIRMAN
INSTITUTIONAL ETHICS COMMITTEE
VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN
Elayampalayam-637 20
Tiruchengode (Tk) Namakka (Dt),

SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN
Elayampalayam-637 205.
Tiruchengode (Tk) Namakkal (Dt),
Tamilnadu.

ANNEXURES – II



VIVEKANDHA
DENTAL COLLEGE FOR WOMEN
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.
Approved by DCI and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University
Elayampalayam - 637 205. Tiruchengode Tk., Namakkal Dt., Tamil Nadu.
Phone : 04288 - 234891, FAX : 04288 - 234891.

VIVEKANDHA
EDUCATIONAL INSTITUTIONS

301/VDCW/2016

Ref.

09.08.2016

Date : .....

Dr. (Capt.) S. Gokulanathan, B.Sc., M.D.S.,
Principal.

To

The Administrative officer,
Vivekanandha Educational Institution,
Tiruchengode.

Respected sir,

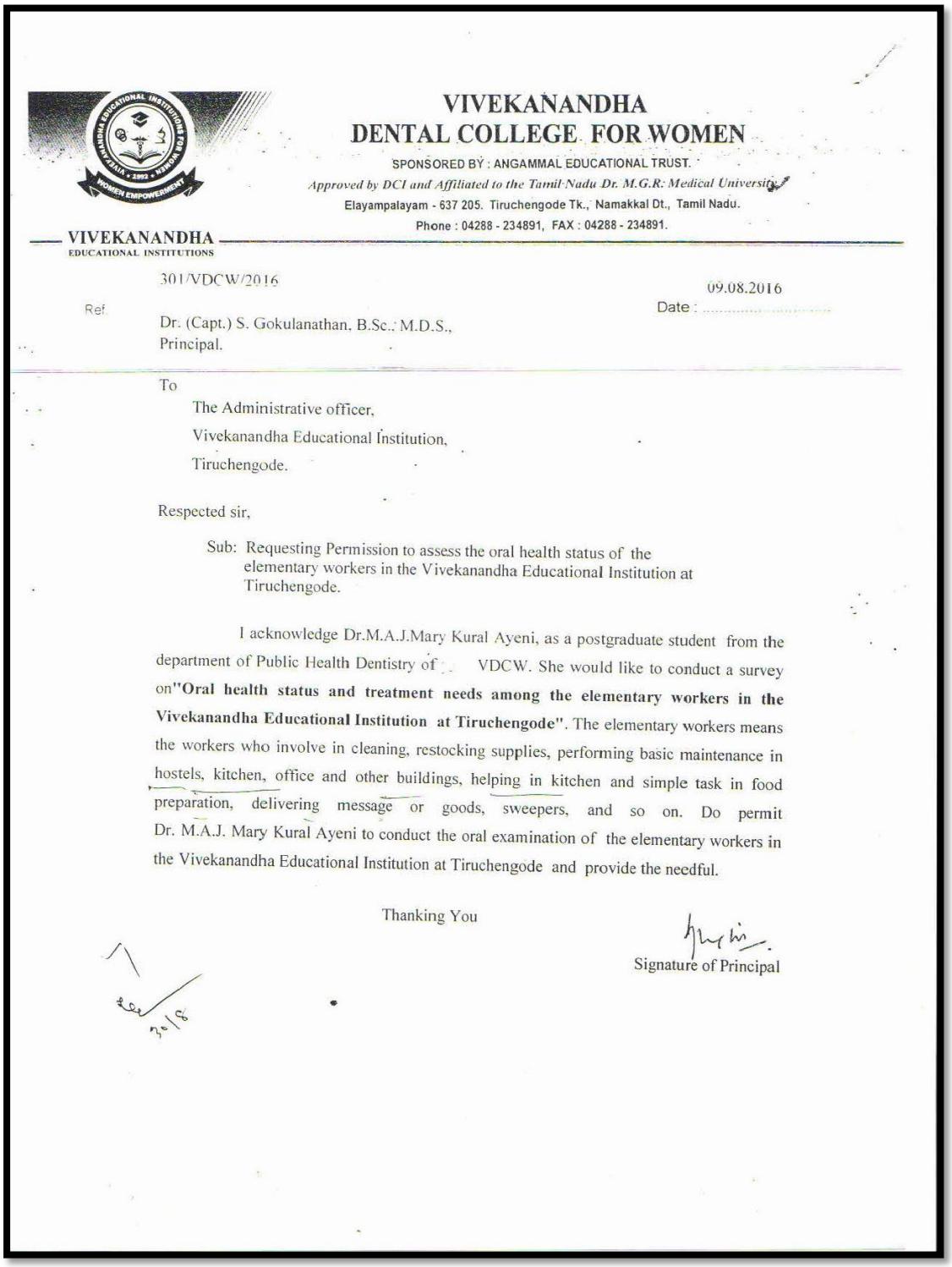
Sub: Requesting Permission to assess the oral health status of the elementary workers in the Vivekanandha Educational Institution at Tiruchengode.

I acknowledge Dr.M.A.J.Mary Kural Ayeni, as a postgraduate student from the department of Public Health Dentistry of [redacted] VDCW. She would like to conduct a survey on**"Oral health status and treatment needs among the elementary workers in the Vivekanandha Educational Institution at Tiruchengode"**. The elementary workers means the workers who involve in cleaning, restocking supplies, performing basic maintenance in hostels, kitchen, office and other buildings, helping in kitchen and simple task in food preparation, delivering message or goods, sweepers, and so on. Do permit Dr. M.A.J. Mary Kural Ayeni to conduct the oral examination of the elementary workers in the Vivekanandha Educational Institution at Tiruchengode and provide the needful.

Thanking You

Signature of Principal

ANNEXURE - III



VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN
SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.
Approved by DCI and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University
Elayampalayam - 637 205. Tiruchengode Tk., Namakkal Dt., Tamil Nadu.
Phone : 04288 - 234891, FAX : 04288 - 234891.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

Ref. 301/VDCW/2016

Date : 09.08.2016

Dr. (Capt.) S. Gokulanathan, B.Sc., M.D.S.,
Principal.

To
The Administrative officer,
Vivekanandha Educational Institution,
Tiruchengode.

Respected sir,

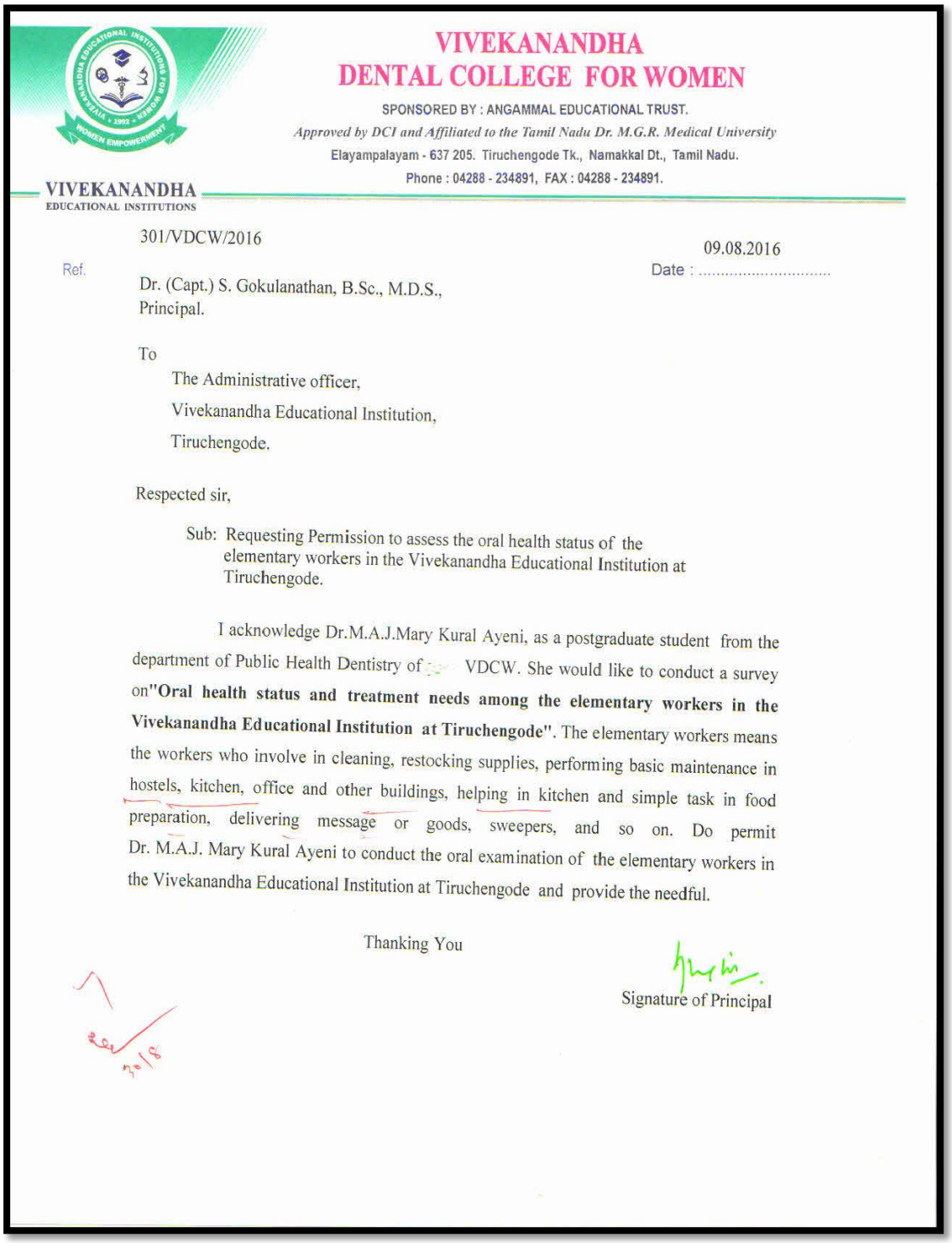
Sub: Requesting Permission to assess the oral health status of the elementary workers in the Vivekanandha Educational Institution at Tiruchengode.

I acknowledge Dr.M.A.J.Mary Kural Ayeni, as a postgraduate student from the department of Public Health Dentistry of VDCW. She would like to conduct a survey on**"Oral health status and treatment needs among the elementary workers in the Vivekanandha Educational Institution at Tiruchengode"**. The elementary workers means the workers who involve in cleaning, restocking supplies, performing basic maintenance in hostels, kitchen, office and other buildings, helping in kitchen and simple task in food preparation, delivering message or goods, sweepers, and so on. Do permit Dr. M.A.J. Mary Kural Ayeni to conduct the oral examination of the elementary workers in the Vivekanandha Educational Institution at Tiruchengode and provide the needful.

Thanking You

Signature of Principal

ANNEXURE - IV



VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN

SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST.

Approved by DCI and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University

Elayampalayam - 637 205. Tiruchengode Tk., Namakkal Dt., Tamil Nadu.

Phone : 04288 - 234891, FAX : 04288 - 234891.

VIVEKANANDHA
EDUCATIONAL INSTITUTIONS

Ref. 301/VDCW/2016

Date : 09.08.2016

Dr. (Capt.) S. Gokulanathan, B.Sc., M.D.S.,
Principal.

To

The Administrative officer,
Vivekanandha Educational Institution,
Tiruchengode.

Respected sir,

Sub: Requesting Permission to assess the oral health status of the elementary workers in the Vivekanandha Educational Institution at Tiruchengode.

I acknowledge Dr.M.A.J.Mary Kural Ayeni, as a postgraduate student from the department of Public Health Dentistry of VDCW. She would like to conduct a survey on**"Oral health status and treatment needs among the elementary workers in the Vivekanandha Educational Institution at Tiruchengode"**. The elementary workers means the workers who involve in cleaning, restocking supplies, performing basic maintenance in hostels, kitchen, office and other buildings, helping in kitchen and simple task in food preparation, delivering message or goods, sweepers, and so on. Do permit Dr. M.A.J. Mary Kural Ayeni to conduct the oral examination of the elementary workers in the Vivekanandha Educational Institution at Tiruchengode and provide the needful.

Thanking You

Signature of Principal

ANNEXURE - Va

INFORMED CONSENT FORM

VIVEKANANDHA DENTAL COLLEGE FOR WOMEN
DEPARTMENT OF PUBLIC HEALTH DENTISTRY
TIRUCHENGODE-637 205
TAMILNADU

S.NO:

Investigator : Dr. M.A.J. Mary Kural Ayeni

Title: Oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode,Tamilnadu-A cross-sectional study

Name : Mr/Ms _____
Address: _____
_____
_____
_____

Gender : Male / Female
Age : Yrs

I. _____. give my consent voluntarily to participate as a participant in this study, I agree to the following:

1. I have been informed to my satisfaction about the purpose of the study and study procedures.
2. I understand that the study involves questions which may sometimes be personal.
3. I agree to co-operate fully for complete examination.
4. I am told that the investigating doctor and the institution will keep my identity confidential.
5. I understand that I have rights to withdraw myself from the study and also that the investigator has the right to exclude me from the research at any point of time.

Name | Signature/ Thumb impression of Participant/Parent/Guardian | Date:

Principal Investigator | Signature of principal investigator | Date:

ANNEXURE - Vb

வ.எண்:

ஒப்புதல் படிவம்

விவேகானந்தா மகளிர் பல் மருத்துவ கல்லூரி
சமூகநல பல் மருத்துவத்துறை
திருச்செங்கோடு-637 205

ஆய்வாளர்:Dr.M.A.J..மோரிகுறள் எயினி

தலைப்பு : கடைநிலை ஊழியர்களின் வாய்நலம் மற்றும் அவற்றிற்கான சிகிச்சைகள்-ஒரு ஆய்வறிக்கை

பெயர் : திரு / திருமதி இனம் : ஆண் / பெண்

முகவரி : வயது :

நான் ..... என்னுடைய சுயநினைவுடனும் மற்றும் முழு சுதந்திரத்திடனும் நான் இந்த பல் மருத்துவ பரிசோதனையில் சேர்ந்து கொள்ள ஒப்புதல் அளிக்கிறேன்.

1. எனக்கு இந்த பரிசோதனை பற்றிய முழு தகவலும் அளிக்கப்பட்டுள்ளது.
2. இந்த பரிசோதனையில கேட்கப்பட உள்ள கேள்விகள் என் சுயம் சார்ந்ததாக இருக்கலாம் என்பது எனக்கு அறிவிக்கப்பட்டுள்ளது.
3. இந்த பரிசோதனையில் செய்யப்படும் பரிசோதனைகளுக்கு முழு ஒத்துழைப்பு அளிப்பேன்
4. என்னைப் பற்றிய விவரங்களை பரிசோதனை செய்யும் மருத்துவரோ அல்லது மருத்துவமனையோ வெளியிடாது என்று உறுதியளிக்கப்பட்டுள்ளது.
5. இந்தப் பரிசோதனையிலிருந்து என்னை நானோ அல்லது மருத்துவரோ எப்பொழுது வேண்டுமானாலும் விடுவித்துக் கொள்ளலாம் என்பது தெரிவிக்கப்பட்டுள்ளது.

பெயர்	கையெப்பம் / கைவிரல்ரேகை பங்கேற்பாளர்	தேதி
ஆய்வாளர்	ஆய்வாளர் கையெப்பம்	தேதி

ANNEXURE -VIa

INFORMATION SHEET

"Oral health status and treatment needs among elementary workers* in an educational institution at Tiruchengode, Tamilnadu- a cross sectional study."

I, Dr. M.A.J. Mary Kural Ayeni, first year post graduate student, Department of Public Health Dentistry of Vivekanandha Dental College for Women, Tiruchengode is doing research work titled " Oral health status and treatment needs among elementary workers in an educational institution at Tiruchengode, Tamilnadu - A cross sectional study" as per the university norm. Hence I kindly request you to participate in this research which includes collecting demographic data, assessing oral hygiene practices, tobacco usage and oral examination . The oral examination will be carried out using sterile mouth mirror and WHO probe to find out the oral health status . The examination will take 15 - 20 minutes. Participation in the study is entirely on the will of the subject, and he/she can withdraw from the study at any stage. The oral examination , being non invasive, will definitely not include any risk or harm to the subject. His / Her identity will not be revealed and full confidentiality will be assured .The study is for research purpose only. No charges will be applicable for participation in this study. You will also be provided with comprehensive dental treatment at Smile Dental Clinic situated in the main campus of Vivekanandha Educational Institution, Elayampalayam.

Signature of the Investigator

If you wish to get more information , you may contact:

Investigator

Dr .M.A.J. Mary Kural Ayeni
Post graduate student
Department of Public Health Dentistry
Vivekanandha Dental College for Women
Elayampalayam Tiruchengode
Contact Number: 9443519595

ANNEXURE -VIb

தகவல் படிவம்

கடைநிலை ஊழியர்களின் வாய்நலம் மற்றும் அவற்றிற்கான சிகிச்சைகள்- ஒரு ஆய்வறிக்கை

மருத்துவர் M.A.J. மேரி குறள் எயினி ஆகிய நான் திருசெங்கோட்டில் உள்ள விவேகானந்தா மகளிர் பல் மருத்துவக் கல்லூரியில் முதலாம் ஆண்டு முதுநிலை பல்மருத்துவம் பயிலும் மாணவி ஆவேன். முதுநிலை பல்மருத்துவத்தின் ஒரு அங்கமாக பல்கலைக்கழக விதிமுறைகளின்படி கடைநிலை ஊழியர்களின் வாய்நலம் மற்றும் அவற்றிற்கான சிகிச்சைகள் பற்றிய ஆய்வறிக்கை ஒன்றை சமர்ப்பிக்க வேண்டியுள்ளது. அதனால் தங்களது பற்களின் ஆரோக்கியத்தை அறிய வேண்டியுள்ளதால் தாங்கள் இந்த ஆய்வில், 15-20 நிமிடங்கள் பங்கேற்க வேண்டுகிறேன். நீங்கள் இந்த பரிசோதனைக்கு உட்படும் முன் இதைப்பற்றி விளக்கமாக என்னிடம் பேசவும் நான் விளக்கம் அளிக்கவும் கடமைப்பட்டுள்ளேன். உங்களுக்கு இந்த பரிசோதனையின் முலம் எந்த வித தீங்கும் நேராது. இதில் பங்கேற்பவரின் விவரங்கள் அனைத்தும் இரகசியமாக வைக்கப்படும். இந்தப் பரிசோதனையிலிருந்து நீங்களோ அல்லது மருத்துவரோ எப்பொழுது வேண்டுமானாலும் விடுவித்துக் கொள்ளலாம் என்பதை தெரிவித்துக்கொள்கிறேன் . மேலும் இந்த பரிசோதனையின் மூலம் வாய்நலம் பராமரிப்பு மற்றும் வாய்நோய் தடுப்பு முறைகள் பற்றிய விளக்கமும், ஆலோசனைகளும், பங்கேற்பாளர்களுக்கு விவேகானந்தா கல்வி நிலையத்தில் உள்ள ஸமைல் பல் மருத்துவமனையில் அளிக்கப்படும்.

ஆய்வாளர் கையெப்பம்

மேலும் விவரங்களுக்கு நீங்கள் தொடர்பு கொள்ள வேண்டிய முகவரி
Dr.M.A.J.மேரிகுறள் எயினி
சமூகநல பல்மருத்துவத்துறை
விவேகானந்தா மகளிர் பல்மருத்துவக் கல்லூரி
எளையம்பாளையம்
திருச்செங்கோடு
தொலைபேசி எண் 9443519595

ANNEXURE -VIIa

QUESTIONNAIRE

"ORAL HEALTH STATUS AND TREATMENT NEEDS AMONG ELEMENTARY WORKERS IN AN EDUCATIONAL INSTITUTION AT TIRUCHENGODE, TAMILNADU- A CROSS SECTIONAL STUDY."

Principle investigator: Dr. M.A.J. Mary Kural Ayeni

1) Demographic Data: Date:

1. Name : Mr. / Ms. / Mrs.
2. Age :
3. Gender :
4. Date of Birth :
5. Place of birth :
6. Religion :
7. Marital status :
8. Level of education :

   a. No formal schooling b. Less than primary school
   c. Primary school completed d. Secondary school completed
   e. High school completed e. College university completed
9. Occupation :
10. Income :
11. Family Income :
12. Address :
13. Contact number :
14. Email id :

ANNEXURE- VIIb

"ASSESSMENT OF ORAL HYGEINE PRACTICES AMONG ELEMENTARY WORKERS IN AN EDUCATIONAL INSTITUTION AT TIRUCHENGODE, TAMILNADU- A CROSS SECTIONAL STUDY."

1) Do You Clean Your Teeth : Yes / No

2)If Yes, how do you clean your teeth : ☐

a) Neem Stick b) Charcoal c) Finger And tooth Powder

d) Finger And Brick Powder e) Finger And Salt f) Tooth brush and tooth paste

g) Tooth brush and tooth powder

Any other Specify _____

3)How often do you clean your teeth? : ☐

a) Occasionally b) Once Daily

c) Twice Daily d) More than twice e) Any Other specify

4) What type of brush do you use? : ☐

a) Hard b) Soft

c) Medium d) Never Noticed

5)Which Technique do you use for brushing?: ☐

a) Horizontal b) Vertical

c) Circular d) Combination

6) How often do you change your tooth brush? : ☐

a) When useless b) Once in 3 months

c) Every 6 months d) Once a year

7) Do you use any of these other oral hygiene aids ? : ☐

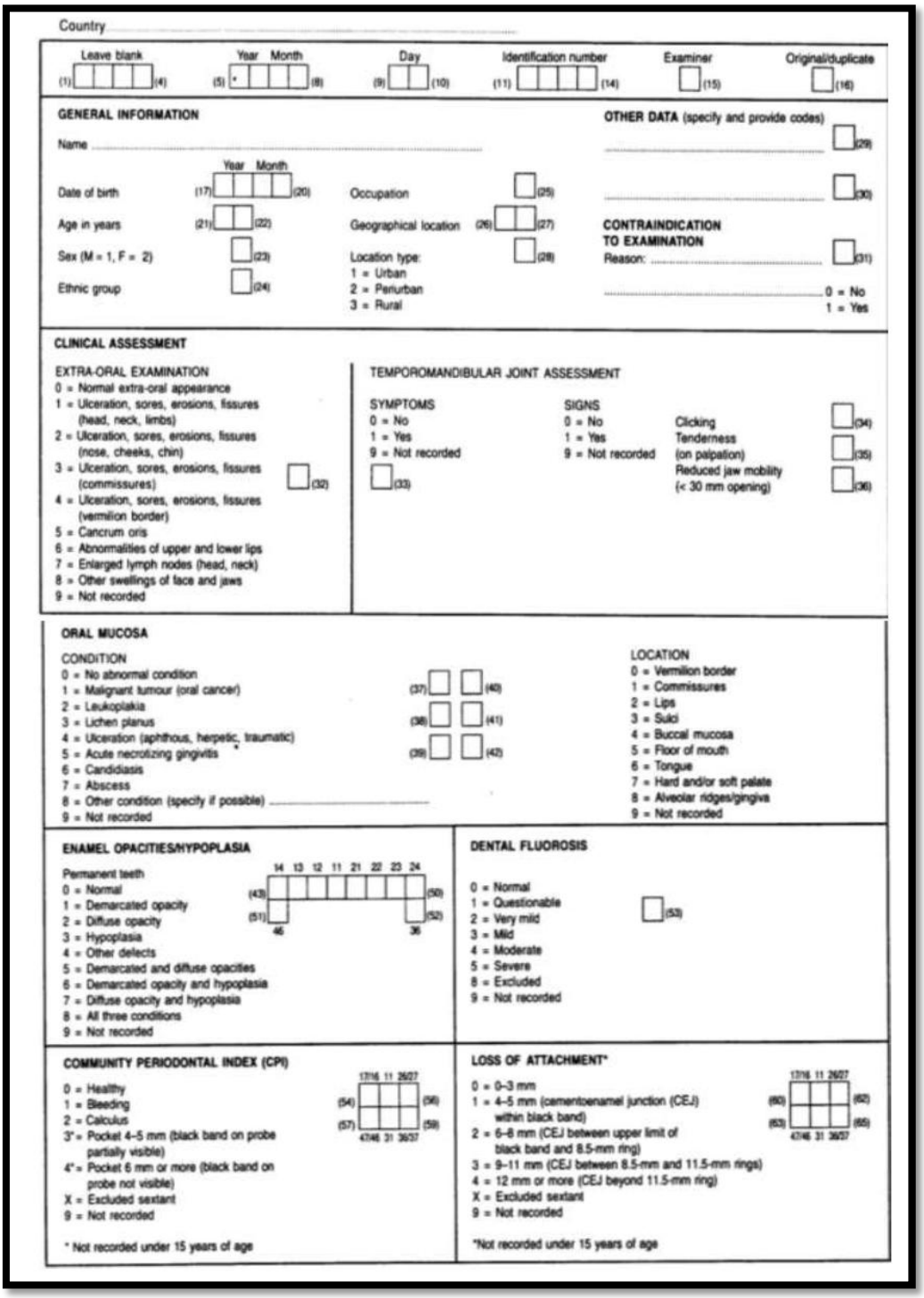
a) Floss b) Inter dental Brush c) Mouth Rinse

d) Wooden tooth pick e) Tongue cleaner f) None

8) Do you have habit of : a) Tobacco usage b) Alcohol c) Both d) None of the above

ANNEXURE -VIII

WHO ASSESSMENT FORM 1997



Country .....

Leave blank (1)(4) | Year Month (5)(8) | Day (9)(10) | Identification number (11)(14) | Examiner (15) | Original/duplicate (16)

GENERAL INFORMATION

Name .....

Date of birth (Year Month) (17)(20)

Age in years (21)(22)

Sex (M = 1, F = 2) (23)

Ethnic group (24)

Occupation (25)

Geographical location (26)(27)

Location type: (28)
1 = Urban
2 = Periurban
3 = Rural

OTHER DATA (specify and provide codes)

..... (29)

..... (30)

CONTRAINDICATION TO EXAMINATION

Reason: ..... (31)

..... 0 = No 1 = Yes

CLINICAL ASSESSMENT

EXTRA-ORAL EXAMINATION

0 = Normal extra-oral appearance
1 = Ulceration, sores, erosions, fissures (head, neck, limbs)
2 = Ulceration, sores, erosions, fissures (nose, cheeks, chin)
3 = Ulceration, sores, erosions, fissures (commissures) (32)
4 = Ulceration, sores, erosions, fissures (vermilion border)
5 = Cancrum oris
6 = Abnormalities of upper and lower lips
7 = Enlarged lymph nodes (head, neck)
8 = Other swellings of face and jaws
9 = Not recorded

TEMPOROMANDIBULAR JOINT ASSESSMENT

SYMPTOMS
0 = No
1 = Yes
9 = Not recorded
(33)

SIGNS
0 = No
1 = Yes
9 = Not recorded

Clicking (34)
Tenderness (on palpation) (35)
Reduced jaw mobility (< 30 mm opening) (36)

ORAL MUCOSA

CONDITION

0 = No abnormal condition
1 = Malignant tumour (oral cancer)
2 = Leukoplakia
3 = Lichen planus
4 = Ulceration (aphthous, herpetic, traumatic)
5 = Acute necrotizing gingivitis
6 = Candidiasis
7 = Abscess
8 = Other condition (specify if possible) .....
9 = Not recorded

(37)(40)
(38)(41)
(39)(42)

LOCATION

0 = Vermilion border
1 = Commissures
2 = Lips
3 = Sulci
4 = Buccal mucosa
5 = Floor of mouth
6 = Tongue
7 = Hard and/or soft palate
8 = Alveolar ridges/gingiva
9 = Not recorded

ENAMEL OPACITIES/HYPOPLASIA

Permanent teeth

0 = Normal
1 = Demarcated opacity
2 = Diffuse opacity
3 = Hypoplasia
4 = Other defects
5 = Demarcated and diffuse opacities
6 = Demarcated opacity and hypoplasia
7 = Diffuse opacity and hypoplasia
8 = All three conditions
9 = Not recorded

14 13 12 11 21 22 23 24
(43) (50)
(51) (52)
46 36

DENTAL FLUOROSIS

0 = Normal
1 = Questionable
2 = Very mild
3 = Mild
4 = Moderate
5 = Severe
8 = Excluded
9 = Not recorded

(53)

COMMUNITY PERIODONTAL INDEX (CPI)

0 = Healthy
1 = Bleeding
2 = Calculus
3* = Pocket 4–5 mm (black band on probe partially visible)
4* = Pocket 6 mm or more (black band on probe not visible)
X = Excluded sextant
9 = Not recorded

17/16 11 26/27
(54) (56)
(57) (59)
47/46 31 36/37

* Not recorded under 15 years of age

LOSS OF ATTACHMENT*

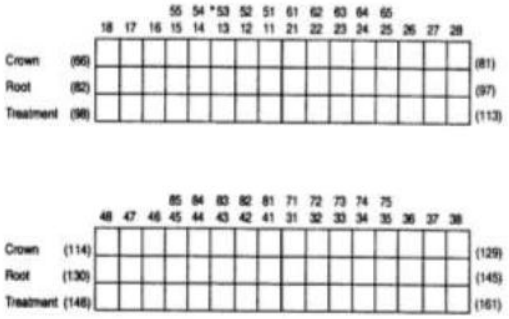
0 = 0–3 mm
1 = 4–5 mm (cementoenamel junction (CEJ) within black band)
2 = 6–8 mm (CEJ between upper limit of black band and 8.5-mm ring)
3 = 9–11 mm (CEJ between 8.5-mm and 11.5-mm rings)
4 = 12 mm or more (CEJ beyond 11.5-mm ring)
X = Excluded sextant
9 = Not recorded

17/16 11 26/27
(60) (62)
(63) (65)
47/46 31 36/37

*Not recorded under 15 years of age

DENTITION STATUS AND TREATMENT NEED

Identification number [ ][ ][ ][ ]



Primary teeth *Crown*	Permanent teeth *Crown/Root*		STATUS	TREATMENT
A	0	0	Sound	0 = None
B	1	1	Decayed	P = Preventive, caries-arresting care
C	2	2	Filled, with decay	F = Fissure sealant
D	3	3	Filled, no decay	1 = One surface filling
E	4	—	Missing, as a result of caries	2 = Two or more surface fillings
—	5	—	Missing, any other reason	3 = Crown for any reason
F	6	—	Fissure sealant	4 = Veneer or laminate
G	7	7	Bridge abutment, special crown or veneer/implant	5 = Pulp care and restoration
—	8	8	Unerupted tooth, (crown)/unexposed root	6 = Extraction
T	T	—	Trauma (fracture)	7 = Need for other care (specify).....
—	9	9	Not recorded	8 = Need for other care (specify).....
				9 = Not recorded

PROSTHETIC STATUS

Upper Lower (162)[ ][ ](163)

0 = No prosthesis
1 = Bridge
2 = More than one bridge
3 = Partial denture
4 = Both bridge(s) and partial denture(s)
5 = Full removable denture
9 = Not recorded

PROSTHETIC NEED

Upper Lower (164)[ ][ ](165)

0 = No prosthesis needed
1 = Need for one-unit prosthesis
2 = Need for multi-unit prosthesis
3 = Need for a combination of one- and/or multi-unit prostheses
4 = Need for full prosthesis (replacement of all teeth)
9 = Not recorded

DENTOFACIAL ANOMALIES

DENTITION

(166)[ ][ ](167) Missing incisor, canine and premolar teeth—maxillary and mandibular—enter number of teeth

SPACE

[ ](168) Crowding in the incisal segments:

0 = No crowding
1 = One segment crowded
2 = Two segments crowded

* [ ](169) Spacing in the incisal segments:

0 = No spacing
1 = One segment spaced
2 = Two segments spaced

[ ](170) Diastema in mm

[ ](171) Largest anterior maxillary irregularity in mm

[ ](172) Largest anterior mandibular irregularity in mm

OCCLUSION

[ ](173) Anterior maxillary overjet in mm

[ ](174) Anterior mandibular overjet in mm

[ ](175) Vertical anterior openbite in mm

[ ](176) Antero-posterior molar relation:

0 = Normal
1 = Half cusp
2 = Full cusp

NEED FOR IMMEDIATE CARE AND REFERRAL

Life-threatening condition [ ](177)

Pain or infection [ ](178)

Other condition (specify)..... [ ](179)

0 = Absent
1 = Present
9 = Not recorded

Referral [ ](180)
0 = No
1 = Yes
9 = Not recorded

NOTES